THE OLD TIMER'S BULLETIN

OFFICIAL JOURNAL, ANTIQUE WIRELESS ASSOCIATION, INC.

Published for the Collector, Historian and Old Time Wireless Operator

VOL. 35 NOVEMBER 1994 NO. 4

Telegraphy's 150th Anniversary

Christmas dawn finds the telegrapher keeping nightly vigil as a switchman pours a steaming cup of boiled coffee. This scene is from an old holiday greeting card found in the AWA's archives. It reminds us of the importance of telegraphy, which began 150 years ago, in transmitting news and information across a growing nation.

ANTIQUE WIRELESS ASSOCIATION, INC.
BOX E
BREESPORT, NEW YORK 14816

"The Old Timer's Bulletin" — The AWA Journal

The Old Timer's Bulletin is published approximately four times a year, on an all-volunteer basis, by and for members of the Antique Wireless Association, Inc. AWA is a nonprofit historical society founded in 1952 and chartered by the State of New York. *The Old Timer's Bulletin* is available through AWA membership. Its issuance is subject to change from time to time as to frequency, content, and size. This publication does not accept paid advertising. It is not liable in any way for any buying-and-selling transaction entered into as a result of its content.

OFFICERS
President: Bruce D. Roloson
1st V.P.: Richard Ransley, WA2TLR
2nd V.P.: William Fizette, K3ZJW
Secretary: Joyce Peckham
Treasurer: Dexter Deeley, N2XYS
Curator: Bruce Kelley, W2ICE
Attorney: Sherwood Snyder: W2KFU

DIRECTORS
Art Albion
Larry Babcock
Dexter Deeley, N2XYS
Chris Fandt, WB2WAO
William Fizette, K3ZJW
Ron Frisbie
Edward Gable, K2MP
Bruce Kelley, W2ICE
Joyce Peckham
Lauren Peckham
Mani Pires
Richard Ransley, WA2TLR
Bruce Roloson
Roland St. Louis, K2LKH
Ludwell Sibley, KB2EVN
John Wenrich, K2RY
Morgan Wesson

OTB STAFF
Publisher: Bruce D. Roloson
Editor: Alfred G. Green, Jr.
CONTRIBUTING EDITORS:
Amateur Radio: Mike Raide, KF2MW
Bruce Kelley, W2ICE
Classified Ads: Richard Ransley
Comm. Receiver: Bill Fizette, K3ZJW
Early Equipment Profile:
Lauren Peckham
Key & Telegraph: Roger Reinke
Meet the Collectors:
Rodney Schrock, KD3OR
The Museum: Bruce Kelley, W2ICE
New Members: Joyce Peckham
Obituaries: Charles Griffen, W1GYR
Restoration: Ludwell Sibley, KB2EVN
Television: Jack Davis
Transistor Topics: [Open]
Vacuum Tube: Bro. Pat Dowd, W2GK
Index Chris Cross

CONFERENCE COMMITTEE
Chairman: Bill Fizette
Programs: Lauren Peckham
Auctions: Lauren Peckham & Ed Gable
Equipment Contest: Ralph Williams
Registration: Joyce Peckham
Photos: Richard Ransley

HONORARY MEMBERS
Gioia Marconi Braga
Charles Brelsford, W2WW
Anthony Constable
Fred Hammond, VE3HC
Grote Reber
Elliot Sivowitch

REGIONAL MEETING REPS
Arizona: Chuck Brelsford, W2WW
California: Floyd Paul, W6THU
Canada: Fred Hammond, VE3HC
D.C. Area: Paul Mooney, K4KRE
Florida: Norm Smith
Indiana: Ross Smith
New Jersey: John Richardt, W2WIY
Mike Feher, N4FS
New York: Lauren & Joyce Peckham
North Carolina: Ron Lawrence, KC4YOY
Texas: Chevie Crandell (Dallas)
David Moore (Houston)

AWARDS ADMINISTRATORS
AWA Houck Awards: John Terrey
BK-OTB Award: Bill Denk
Equipment Awards: Ralph Williams
Taylor Award: Ross Smith
Tyne Award: Lauren Peckham

WHOM TO CONTACT

Please write legibly. Enclosing an SASE speeds replies.

Dues and address changes: Joyce Peckham (Secretary), Box E, Breesport, NY 14816, (607) 739-5443; FAX: (607) 796-6230. Dues: 1 Year, $12; 2 Years, $22; overseas (airmail), $15. Checks payable to AWA.

Bulletin material and news of non-joint meets: Bruce D. Roloson, Publisher, 2 Walnut Place, Apalachin, NY 13732, (607) 625-3031. (Exception: column material should go to the column editors.)

Orders for the *AWA Review* or back issues of *OTB:* Debbie Roloson, 2 Walnut Place, Apalachin, NY 13732.

Want ads, coordination of joint meets and slide/video shows: Richard Ransley (First Vice President), Box 41, Sodus, NY 14551.

Museum operation: Bruce Kelley (Curator), 59 Main St., Bloomfield, NY 14469.

AWA official business: Bruce Roloson (President), 2 Walnut Place, Apalachin, NY 13732.

Annual conference business: William Fizette (Second Vice President), RD 1, Box 55, Henryville, PA 18332.

Financial reports: Dexter Deeley (Treasurer), 8 Briar Circle, Rochester, NY 14618.

AWA NETS (EST)

PHONE:
Sun. 7247 kHz SSB, noon (NCS: N4FS); 3837 kHz, QRP AM, 4 pm, Nov. through April (NCSs: W2ICE & AA2CU)
Tues. 14274 kHz SSB, 2:30 pm (NCSs: KC3YE and W0FXY) 3837 kHz SSB, 8 pm (NCS N4FS)
Mon.-Wed.-Fri.: 3867 kHz, 9:30 am (NCSs: W2ICE & W2SHN)

CW:
Daily, 4 pm, 7050 kHz (NCS varies)
First Wed. of each month, 8 pm, 7050 kHz

2-M REPEATER (Rochester area):
Mon., 7:30 pm (NCS: W2ICE)
Receive 146.820 MHz; transmit 146.220 MHz

© 1994 ANTIQUE WIRELESS ASSOCIATION, INC.

FROM THE PUBLISHER

Bruce Roloson

As you can see in this edition of *OTB,* we have more changes. Al Green is the new Editor. Al is a very talented addition as you can see by his comments below.

All submissions for the *OTB* and the *AWA Review* will still be sent to me. I would ask that anyone who feels they have previously submitted an article for the *OTB* or the *Review,* please verify with me that I do indeed have it.

Please give a big welcome to Al Green!

FROM YOUR NEW EDITOR

A pleasure it is to be the editor of *The Old Timers Bulletin.*

Allow me to introduce myself: I'm called Al and sometimes Big Al because of my love for Italian food. Formally I'm Alfred G. (as in George) Green, Jr., and I live not far from Publisher Bruce Roloson. A native of New Jersey, I have lived in Mario's welfare state for some 24 years.

My career has been varied and, until recently, an adventure. I have been a disc jockey, broadcast announcer and journalist, print journalist (11 years) and corporate communicator (12 years) for two electric and natural gas utilities. Earlier this year I was "downsized" in a corporate restructuring . . . a similar "rightsizing" to that with which many IBMers have suffered.

In my last utility position, I became a desktop (now called electronic) publishing whiz and have an IBM-compatible computer setup in my home. My expertise includes PageMaker (I was a beta tester or guinea pig during the development of version 5.0) and several word processing and graphics programs.

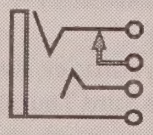
Your comments on my first effort as your editor would be appreciated. I may be reached through Bruce Roloson, or directly at 312 Rayelene Drive, Vestal, NY 13850-5722, (607) 754-8036.

If you like the way *OTB* looks and have need for letters, brochures, newsletters, etc. published for other organizations with which you are affiliated, I would solicit and encourage your business.

My résumé is available for any of you who could use a professional corporate communicator (media, government, community, consumer, and employee relations) in your business or with your company. I am willing to relocate virtually anywhere. —AGG

CONTENTS

AWA News....4
Calendar....4
OTB Back Issues....6
Order Form — AWA Review and OTB....6
Making Mating Connectors — Course 501....7
John Scott Taggart and the Negatron....8
Key and Telegraph: The Right Stuff....9
Before and After the Mercury Super Ten....10
Equipment in AWA Museum: Rare Marconi Detector....13
Historic TV Camera Abandoned on the Moon....14
Headphone Safety....15
Broadcast DX and the "Radio Craze"....16
The First WAC Certificate....17
Introduction to Collecting: Early Radio Receivers....18
Quenched-Gap Spark Transmitters....20
Index to the AWA Review....21
The Communications Receiver: The Breting 14 Communications Receiver....26
Old Equipment Contest Winners....34
AWA 33rd Annual Conference....36
The James Millen Memorial Station at AWA....41
The Novice Collector and His First AC Set...47
The Mystique of Three-Letter Call Signs....49
More Headsets — A Canadian View....52
John A. Myers Called to Rest....52
Carrier-Operated Loudspeaker Control — 1940s Style....53
An Essay - A Psychological Foothold....55
The Loudspeaker: Florentine Art Productions, Inc....57
Recent Radio, TV and Entertainer Obituaries....58
Classified Ads....61
McMurdo Silver Masterpiece VI....66
AWA Museum News....Inside Back Cover



AWA NEWS

CALENDAR

(AWA-sponsored events in **bold** type)

Nov 11-13 ..... 1929 QSO Party
Dec 4 & 11 .... Millen Station Operations
Feb 22-23 & 25-26 Annual OT Contest
May 7 ..... AWA Spring Meet, Bloomfield, NY
May 14 ..... Northern NJ Spring Meet, Schooley's Mountain
May 19,29 ..... Radio DAze'95 at Hotel Seville, Bloominton, MN
May 21 ..... Rochester Hamfest, Rochester, NY

OTB POLICY ON PROMOTING EVENTS

You get the info to us, and we'll announce it.

For joint club-AWA meetings (with video/slide shows, etc.), please send the information in through Richard Ransley, the coordinator. For stand-alone club events, just get it in to the *OTB* editor - addresses on the inside front cover. Elegant format is not necessary; timeliness is. We need the simple facts up-front; we don't want a nice printed brochure, too late to be used. This section of the *OTB* is the last to close, about 4-˚ weeks before the nominal date of the next issue.

After-action reports on events that have been announced in the *OTB* are welcome. Being *news*, they should be sent in while still fresh.

RECURRING MEETINGS

California Historical Radio Society — Quarterly swapmeets in the Ampex Corporation parking lot in Redwood City on August 6, and Nov. 5. Gates open at 8:30 AM. Regional events: general address is CHRS, PO Box 31659, San Francisco, CA 94131; 24-hour voicemail info: (415) 978-9100). (Info from Mike Adams)

Delaware Valley Historic Radio Club — This club in SE Pennsylvania meets, with an equipment auction, the second Tuesday of each month, at the North Penn Amusement Building, 105 Main St. (alias Rte. 113), Souderton. Membership is $5/yr. For details: PO Box 624, Lansdale, PA 19446, or Jay Daveler, (215) 368-2520.

Hudson Valley Antique Radio & Phono Society — Meetings the third Thursday of the month at 7 PM. For meeting, swapmeet, and membership info, write HARPS, PO Box 207, Campbell Hall, NY 10916, or call John or Linda Gramm at (914) 427-2602.

Mid-Atlantic Antique Radio Club — Meets monthly at the New Hope Seventh Day Adventist Church in Burtonsville, MD, Sundays at 2:00 (August 21, Sept. 18). Contacts: Lloyd Kendall, (703) 471-6143, or Joe Koester, (301) 725-4229.

New Jersey Antique Radio Club — Meets second Friday of each month at 7:30 PM. Holds three swapmeets a year. Contact: send SASE to Tony Flanagan, 92 Joysan Terrace, Freehold NJ 07728, (908) 462-6638.

Oklahoma Vintage Radio Collectors — Meets the second Saturday of each month, at Spencer's Barbecue Restaurant, NW 63rd and May Ave. in Oklahoma City. Dinner and socializing starts at 6 PM, meeting at 7. Membership is $12 per year and includes the monthly *Broadcast News*. More info: SASE to OKVRC, PO Box 72-1197, Okla. City 73172-1197; or call (405) 722-0595 or (405) 755-4139 eves.

Ottawa Vintage Radio Club — This club meets monthly (less June and July) at the Conference Room, Ottawa Citizen, 1101 Baxter Rd., Ottawa, Ontario. Contact: Tom Devey, 601 - 810 Edgeworth Ave., Ottawa, ON K2B 5L5, (613) 828-5152. Membership is $10 Can. per year. (The club has made good progress on a massive data base covering "all" prewar Canadian radios, a unique and commendable project.)

Southern California Antique Radio Society — Quarterly flea market and lunch at the Velvet Turtle on Sepulveda Blvd. in Torrance, on the third Saturday of each third month. Information: Floyd Paul, (818) 242-8961.

NORTHERN CALIFORNIA MEET

California Historical Radio Society will hold a meet at Home Video, 101 H St., Benicia. Contact: Jim McDowell. (Details via the CHRS voicemail line, [415] 978-9100) (Mike Adams)

ATTENTION ALL RADIO AMATEURS

SPECIAL W2AN MILLEN TRANSMISSION
WHEN: SUNDAY DEC. 4 & DEC. 11
TIME: 3 P.M. TO 7 P.M. EST.
FREQUENCY: 3867 KC. +/-
MODE : AM - SSB - CW

To celebrate the restoration of the James Millen's famous 1936 W1HRX high power phone transmitter, AWA staff members will work as many stations as possible on all modes at times noted. Special attention will be given to CW stations on the EVEN hour. An unusual QSL card will be sent to all stations worked. QSL to:

AWA Station W2AN
59 Main St., Bloomfield, NY 14469

1929 QSO PARTY
'29 VINTAGE EQUIPMENT

When: Fri. Nov. 11, 6 p.m. EST
to Sun. Nov. 13, 6 p.m.
Transmitter: Self-excited oscillator
with 10 watts or less
Transmission: RST, Power and Circuit
Send Log to: Bruce Kelley, W2ICE (W2AN)
59 Main St Bloomfield, NY 14469
(See August *OTB*, page 24 for more info.)

A REMINDER

THE AWA AM NET-3837 kc. every Sunday 4 p.m. EST. All types of AM transmitters are welcome to check in., N.C.:W2ZM or W2AN

SERVICE SOURCES AVAILABLE

The "AWA Source Sheet," a listing of parts suppliers and services for the radio collector. Cost: only a business-size self-addressed stamped envelope, to AWA, Box E, Breesport, NY 14816.

NEW VIDEO PROGRAM...

...available for club programs. Mike Adams has given AWA a VHS copy of his latest radio production: *The Charles Herrold Story, Broadcasting's Forgotten Father.* A fascinating documentary covering the early work of a pioneer who started broadcasting in 1912. The one hour program was recently shown an station KTEH and will be released to PBS. This program and others are available from : Dick Ransley, Box 41, Sodus, NY 14551.

A SIMPLE SET:

Several newer members have requested information on an inexpensive crystal set. Such a set is now available from Ramsey, a well-known kit manufacturer. The simple set is assembled on a wood base and corresponding coil form with taps and variable condenser for tuning. A unique feature is the 1N34A diode in addition to the cat's whisker galena detector. The set is basic and relatively crude but allows one to pick up local stations. Nice gift for a beginner. The set comes with a single ear plug. Available for $19.95 from: Ramsey Electronics, 793 Canning Parkway, Victor, NY 14564.

TESLA INTERNATIONAL SYMPOSIUM

Each year Nikola Tesla buffs gather in Colorado Springs for their annual meeting to hear well-known speakers and witness demonstrations relative to Tesla's early work. The location is the site of Tesla's experiments in late 1890s.

This year's successful event had the largest attendance to date but unfortunately the main attraction ended in disaster. Bill Wyscok's electrical show with his great magnifier coil system capable of throwing a 50-foot discharge, was canceled because of an intense hail storm that filled the switch gear cabinet (operating at 37.5KV) with water as well as damaging some portions of the coil system. The coil system was shipped from California in a 18-wheeler with cranes used to setup the components in an outdoor arena. AWA members Jim Hardesty and Lee Anderson and others were in attendance.

NIAGRARADIO '94

By Larry Babcock

This was join meet between NFWA and AWA at the Amherst Museum just north of Buffalo, NY. The rainy weather reduced the attendance but not the enthusiasm of those who came. About 100 attended from as far way as New Jersey and Ottawa in Canada. Fortunately only the flea market was outside. Lunch and the auction were held under a large pavilion. A presentation by Jim Hardesty on Tesla was held in the museum auditorium.

Also on permanent display in the museum was the NFWA Club Member's display of early radio artifacts from the Buffalo area plus the museum's own radio and communications exhibit. The NFWA changes the exhibit annually so that each year this meet has a different exhibit for visitors to view. The museum also contains numerous other displays so there is something of interest for spouses as well as the radio collector in the family.

AWA News continued on page 60

OTB BACK ISSUES

The following back issues of *The Old Timer's Bulletin* are available at $2.50 each postpaid, with a 20 percent discount for 6 or more issues and 30 percent off for 12 or more. The 10 special-theme issues contain the normal columns and news, plus a core of features on a particular topic area. The number of special-focus pages in each issue is listed below. Index to *OTB* volumes 20-34 and the *AWA Review* volumes 1-8, free on request with purchase.

VOLUME AND NUMBER

20-3 Muchow Collection/J.F. Arnold Receiver
21-2 1907 Amateur Station/Rola Co. History
22-2 John Stone Bio/Sylvania Tube History
22-3 Radiola III Factory Mods/Cardwell History/ SCR-270 Radar/SE-1420 (IP-501) Receiver
22-4 Cutting & Washington History
23-1 Magnavox, 1911-31/Amateur Radio Stamps
23-3 AK Horn Speakers/Wehnelt Cathode
25-3 RCA 630 TV/French Cable Co./1930 Receiver
25-4 Four-tube Superhets/Comet Pro Receiver
26-1 S-M "Around the World Four"/Cockaday BC Receiver/Building a Rotary-Gap Xmtr
26-2 National FB-7 I/L.L. Israel Bio/W'house RC
26-3 National FB-7 II/Radio in S. Africa/Mercury Super 10/Building a 1929 Receiver
26-4 Gilfillan History I/Sargent Model 11 Rcvr
27-1 Gilfillan History II/Schickerling Tubes
27-2 Early RCA Superhets/BC-348 Rcvr History
28-1 Dynergy AC-Powered Radio/Pilot TC-37 TV
28-2 '26 Radiomovies Today/National AGS I
28-3 Dowd Tube Collection/National AGS II
28-4 SE-1950 Radio Compass/National Sliding-Coil Receivers/Collecting Radio Batteries
29-1 Philco 17 Restoration/ZL2JJ '34 Station
29-2 Fada 460 Restoration/3ZO 1922 Station
29-3 Moorhead Tubes I/British '30s TV I
29-4 Moorhead Tubes II/British '30s TV II
30-1 GE Octagon TV Set/TR-1 Transistor Clones
30-3 **Military Equipment Special** - 17 pgs. of 48
30-4 **Broadcast Receiver Special** - 12 pgs. of 48
31-1 **1903-20 Wireless Special** - 5 pgs. of 48
31-2 **Restoration Special I** - 20 pgs. of 56
31-3 **Tube Special** - 19 pgs. of 48
31-4 **International Special I** - 11 pgs. of 48
32-1 **Communication Gear Special** - 18 pgs. of 48
32-2 An HRO Story/Loewe Tubes/GE M-81
32-4 Marconi V24 Valve/HRO in British Army
33-2 **40th Anniversary Special** ("Best of OTB, 1960-82") - all 48 pgs., incl. RCA Metal Tubes
33-4 Scott Special Rcvr/National Power Units
34-1 British Crystal Sets/National Power Units
34-2 **Restoration Special II** - 17 pgs. of 68 (A few pages photocopied in this issue.)
34-3 **International Special II** - 20 pgs. of 64
34-4 Bell Labs Transistor Set/"Larkspur" Radios
35-1 Radiola & Aeriola Grand/German WW II Magnetrons & Avionics/Tech-Manual Art

ORDER FORM — *AWA REVIEW* AND *OTB*

Please send the following volumes of the AWA Review (Price postpaid in US and Canada. Reviews — $12.50 for one volume; $22.50 for two; $32.50 for three ($14, $24, or $34 elsewhere.):

_____ Copies of Vol. 8 _____
_____ Copies of Vol. 7 _____
_____ Copies of Vol. 6 _____
_____ Copies of *OTB* back issues at $2.50 each (please specify issues by volume and number)
_____
_____

Optional: Extend my AWA membership by 2 years ($22 US & Canada, $30 foreign). _____

TOTAL _____

Name _____

Address _____

_____

_____

Please make checks payable to AWA. Mail to **AWA, 2 Walnut Place, Apalachin, NY 13732**

MAKING MATING CONNECTORS — COURSE 501

Bob Haworth, W2PUA
112 Tilford Road, Somerdale, NJ 08083

How many times has this happened to you? You just purchased that radio you've always wanted at the local flea market or hamfest, only to find after you have it home that some special connector for the antenna or speaker is missing and there is no easily obtained replacement.

Such a fate recently struck me in the purchase of a Zenith 75S29. This radio was unknowingly bought less the loop antenna and the special five-pin connector that linked it to the chassis. Determined not to lose the beauty of this radio for want of either, I wound a loop, then attacked the problem of the missing connector. On the premise that "someone out there" may have a similar problem, here is my solution.

First let me apologize for not having a photo system for macro picture taking, but I will demonstrate the process used via sketches. Hopefully the editor with his magic computer can track with me and produce meaningful data as we go through the process.

The first step is to locate enough pins of the right size to mate with your existing connector. I have found that manufacturers tended to "standardize" connectors to a degree and that both male and female types can usually be found in four- to eight-pin sockets or the bases of tubes of this pin variety. I haven't found a solution for pins as used on miniature glass tubes, except to change both plug and receptacle to a standard seven- or nine-pin configuration. One good source of larger pins is the Amphenol units that were designed for interchassis cabling.

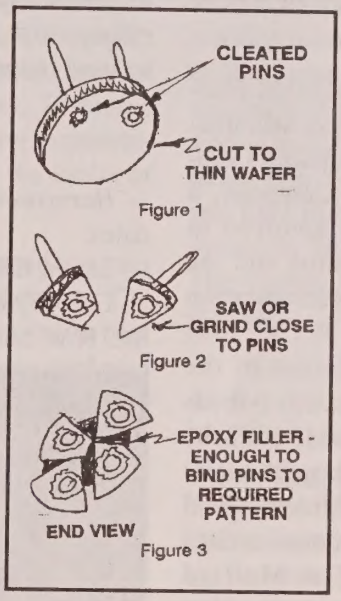
Assuming the male plug is required and that an Amphenol cable plug is available (as in my case) or that a tube base is used, Fig. 1 shows the first step.

If tube bases are used, hacksaw the upper part of the base until you have essentially a thin wafer section that contains the rolled-over tube pin(s) and the supporting Bakelite or plastic.

Using the hacksaw, Fig. 2 shows the results of sawing apart the pins as required. It is important to cut (or grind) close to the pins, since a close odd-dimension spacing is used on some receptacles. Do not damage the rolled-over cleat of the pin.

The pins are then inserted into the required socket about 3/4 of the way. Jockey the pins to get the best fit, but don't worry about the out-of-round characteristic of the outside of the pin arrangement.

Fit pieces of ordinary waxed paper between the socket and the pin arrangement such that, when the pins are pushed in all the way, there will be few places where epoxy, as used in the next step, can seep through and ruin the whole process. It may be necessary to tape the waxed paper down so that it will lie flat and fixed in position.



Using a high-viscosity type epoxy (I use five-minute type A + B), place just enough at the joints of the pin pieces to ensure they are anchored together. Fig. 3 shows the general idea. Do not overfill joints. When cured, the plug is removed from the socket and epoxy is used to fill voids and strengthen the unit. Keep it clear of the pin area.

At this time you may want to use your matching plug as-is by inserting wires. I have found, and use, a neater approach to the "how it looks" problem. I rough-grind the outside surfaces into a near-round shape. I don't worry about the thickness of the various plastic pieces, just the apparent roundness.

The plug is then wired. In systems where the wires are attached to the radio (such as a speaker, etc.) it is best to perform the next step prior to wiring the plug.

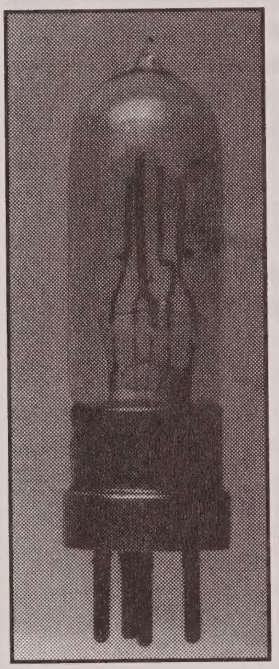
Locate a plastic (or metal) bottle top with an inside diameter slightly larger than the diameter of the pin arrangement. Drill a hole large enough to pass all wires in the center of the cap (for my problem I used a Pepsi cap), slip it over the wires and finish with a ring of epoxy around the rim of the cap. This will take up any odd segmental spaces near the pins and produce a clean-looking (albeit unrepairable) plug to answer the mating-connector problem.

Once you've performed this task you have achieved a passing grade in "Mating Connectors, Course 501"; now it's on to bigger and better restorations in Course 502. Good luck.

JOHN SCOTT-TAGGART AND THE NEGATRON

Jerry Vanicek
PO Box 4743, Chicago, IL 60680

American collectors revere Hugo Gernsback for introducing radio to the general public. Our British counterparts likewise respect John Scott-Taggart for his numerous achievements. In addition to writing a number of textbooks (e. g. *The Book of Practical Radio* and *The Manual of Modern Radio*), Scott-Taggart was the editor of the magazines *Modern Wireless* and *Wireless Weekly*. Today, tube collectors admire the line of valves (tubes) designed by him, the most unusual of which may be the Negatron.



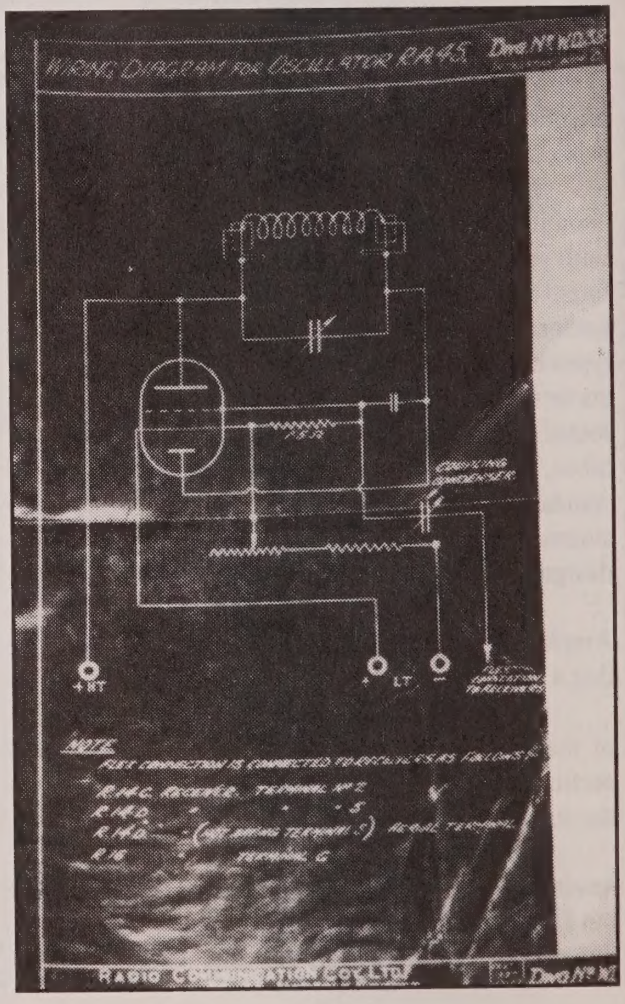
The Negatron illustrated here was manufactured for the Radio Communication Company, a corporation involved in both the marine and the broadcast communication fields. The R.C.C. also held an interest in the Mullard (positive-feedback) patents. In 1927 the R.C.C. was bought out by the Marconi International Marine Communications Co. Ltd. The Mullard valve interest was sold to Philips. The broadcast-receiver part, including the trademark "Polar," was sold to Wingrove and Rogers Ltd.

The Negatron pictured has the trademark "Polar" etched on its envelope. The valve contains four electrodes: a filament, a grid consisting of a vertical wire, and two anodes. The grid is situated directly between the filament and the diversion anode. (The Negatron illustrated in Tyne's *Saga of the Vacuum Tube* contains a conventional grid.)

The Negatron appears to have been used primarily as an oscillator for heterodyne reception. In a letter to one-time collector Joseph Fetsch, R.P. Raikes (then publicity manager of Marconi's Wireless Telegraph Co. Ltd.) describes the operation of the Negatron: "It was used in the R.C.C. marine C.W. telegraphy receivers but I understand that not more than about 500 of the valves were ever made." "I enclose a print of R.C.C. Drawing No. WD.389 showing the circuitry of an oscillator employing this valve. One of the two anodes, referred to as the diversion anode, is controlled by a grid which is capacity coupled to the main anode. If the potential of the main anode increases, so does that of the grid. This causes current to flow to the diversion anode. The current to the main anode therefore falls instead of increasing as its potential increases, producing a negative resistance effect, which, to quote from a text-book of 1925, 'may be used in any convenient manner'."

REFERENCES

— *Harmsworth's Wireless Encyclopedia,* Vol. 2 (no date).
— Letter, June 8, 1955, R. P. Raikes to Joseph Fetsch.
— G.F.J. Tyne, *Saga of the Vacuum Tube* (Indianapolis: H.W. Sams & Co., 1977), pp. 395 and 468.



KEY and TELEGRAPH

EDITED BY
Roger W. Reinke
5301 Neville Court, Alexandria, VA 22310-1113
Please include SASE with correspondence.

THE RIGHT STUFF

The measure of a telegraph operator was straight forward back in "the good old days" — how fast could he or she send and receive? Jobs were secured or lost based on that simple criterion, and gender mattered not, nor did age. The respect paid to the "fast senders" was substantial, and the tangible benefit was a fatter paycheck. Incentive enough, it would seem, to practice at every opportunity and to find the right tools to test the limits of manual dexterity.

Around the turn of the century, speed contests among operators drew considerable attention. The makers of keys were quick to claim that theirs beat the competition. Greeley's "Victor" key was marketed with testimonials of some of the participants in the 1885 New York Telegrapher's Tournament; the three top prize winners (500 words in 10 minutes, 32 seconds) all enthusiastically endorsed the knife-edge trunnioned key. Semi-automatic keys were not yet on the scene, so the distinctive sending style of an operator was widely recognized (which is still true, of course, even for the dwindling number of practitioners of the art). Unstated but implicit in the Morse contests, which continued as late as 1915 before yielding to International code contests, was that manual sending was still regarded as the fastest means of moving a lot of information quickly. Printing instruments operated by keyboard or perforated tape of other schemes all were in existence during this period, but when preparation and/or transcribing time was included, the fast senders with key and sounder left all the mechanical devices behind.

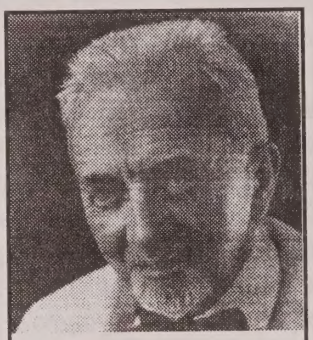
The contests themselves apparently had many of the elements found in a professional sports playoff game. There were disagreements as to the type of text to be sent, what constituted a "word," and how accuracy was to be determined. Receiving abilities were tested, too, but the glory (a Carnegie diamond-studded gold medal, for example) was in beating everybody else on the key. The winners over these years transmitted text from about 52 to 65 words per minute. Trying to describe sending styles is like trying to verbalize how Wayne Gretzky puts the puck in the net; you have to be there. Real appreciation can only be gained by hearing those lightning slingers at work. The torrent of dots and dashes becomes almost musical.

Fortunately, a few contest sessions were recorded, and some of the notable contest winners like Fred McClintic also recorded typical press, railroad dispatching, and stock market transactions for posterity. One AWA member, George Ward, 110 Green Oak Drive, Huntington, WV 25705, has been gathering material about speed contests for years, and seeks any type of recordings of the fast senders. The Morse Telegraph Club has made a few cassette recordings available, but there is no central source or inventory of what might have found its way to a current, common medium, much less Edison cylinders or whatever. *OTB* readers are urged to communicate with "Doc" Ward should they know of any surviving recordings. The extensive collection of telegraph material donated to AWA by the late Louise Moreau is said to contain recordings of McClintic, but verification must await cataloging, etc. For those dedicated souls who still appreciate Morse as sent by the "Champions of the World," access to these recordings would be a most welcome gift.

BEFORE AND AFTER THE MERCURY SUPER TEN

Dr. Robert P. Murray
3216 Assiniboine Avenue, Winnipeg, MB, Canada R3K 0B1

The Mercury Super Ten is a well known superhet of the 1920s. It was well designed for its time, using plug-in coils for band changes, the economical and reliable 215A "peanut tube" (ten of them), and vernier tuning dials as an option with the more expensive models [1-4]. It had some disadvantages, too, such as the lack of provision for peaking each IF stage separately, and an unfortunately low IF frequency at around 150 kHz, which was typical of the times. The designer was Charles A. Lowry. He was an engineering student at the University of Toronto from 1919 to 1923, but did not graduate [5]. He began work on the Super Ten in 1921, and in 1923 joined the H.M. Kipp Company, which had been engaged in selling and repairing bicycles and motorcycles. They were willing to manufacture and market his receiver, and had a national sales force in Canada that was willing to diversify into radio [6].



Charles A. Lowry

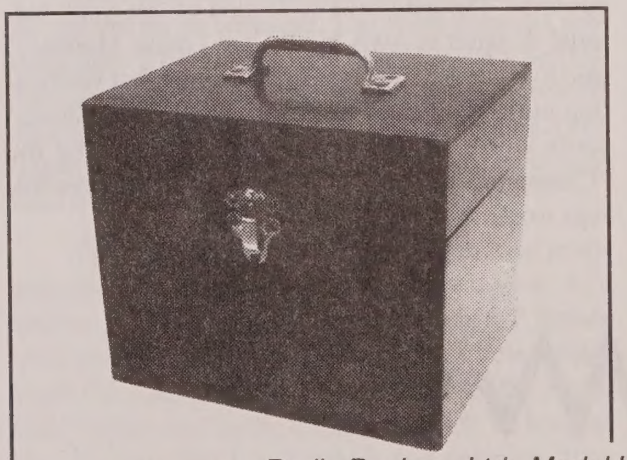
BEFORE THE MERCURY

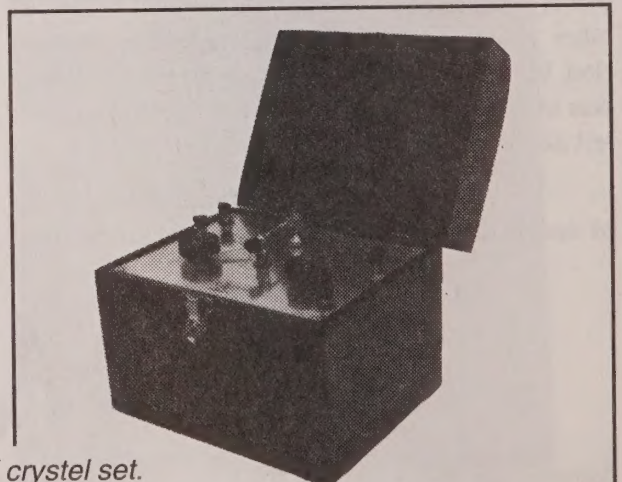
Mr. Lowry was the chief engineer and one of the officers of the Radio Devices Limited of Gananoque, Ontario, Canada during his engineering-student days prior to 1923 [5]. Mr. Lowry was presumably the company's engineer when the Model K crystal set was designed. At least, for want of better information, we are tempted to blame him for it. The box is made from mahogany, but has no ornamentation. A very functional drawer handle adorns the lid. The panel is made from sheet aluminum, etched with dial scales and the company name. The aluminum panel was grounded, and probably provided some shielding that assisted with tuning the receiver.

The underside of the panel is where the surprise awaits us. The wiring of the set consists of aluminum straps fastened to machine screws with nickel-plated nuts. I wondered at first if operators of this set had to dismantle it every month or so to clean the oxide from the junctions in order to make it work. I discovered that my specimen, not cleaned for the five years or so since obtaining it, worked quite well. Well, it sort of worked. With the 70-foot antenna under the roof of my house, and a water-pipe ground, it brought in local stations all across the broadcast band with a healthy volume in the headphones. The primary slider was set for the strongest signal level, and the secondary slider tuned across the contemporary broadcast band. Unfortunately, it typically received three or so stations at once. Further, the aluminum panel is springy, while the sliders are quite stiff to adjust. The result is that any movement of the sliders almost always knocked the cat's whisker off its point, so that the tuning had to be done in silence, and then the point on the crystal found again.

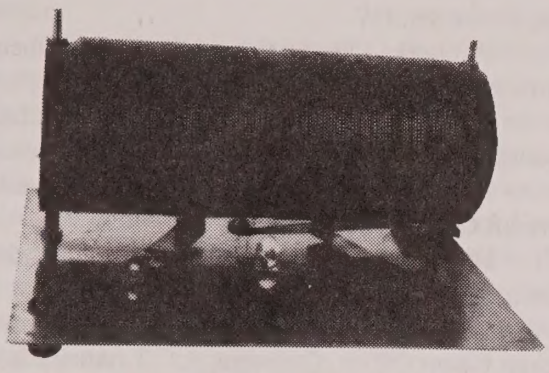
H.M. KIPP AFTER THE MERCURY

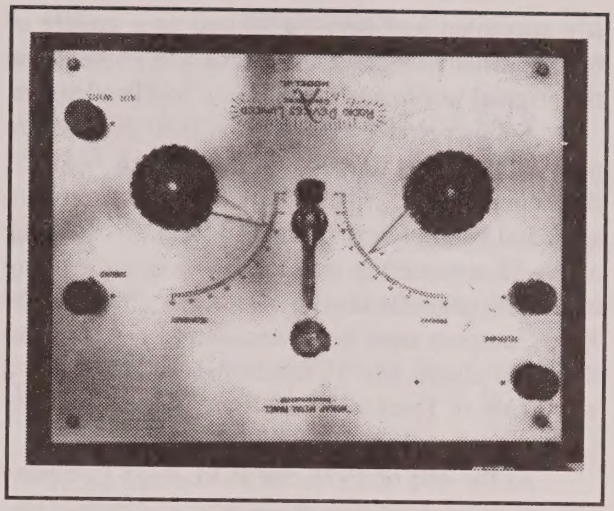
The H.M. Kipp Company continued to manufacture Mr. Lowry's Mercury Super Ten with variations for about five years. I have seven of them





Radio Devices, Ltd., Model K crystel set.



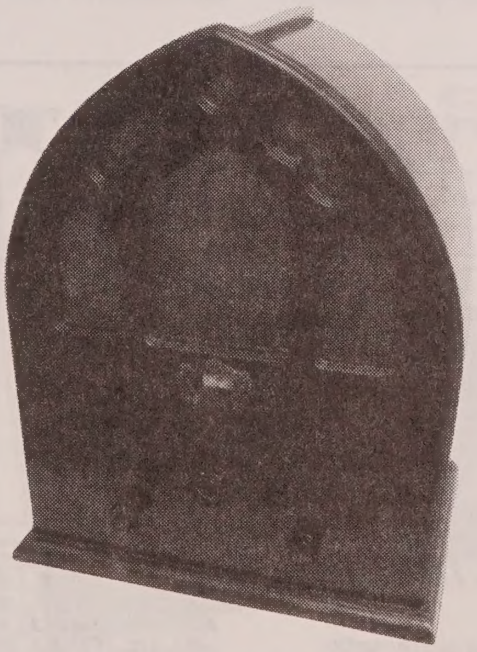


Radio Devices, Ltd., Model K crystel set: bottom (above) and top of panel (right).

and no two are quite alike. Further, I have seen quite a number of minor variations different from the ones I have. Lowry recalled that there had been four main models [6]. The first, in 1923, can be recognized by tuning condensers enclosed in cylinders of transparent celluloid. The second had a split-stator tuning condenser which enabled easier bandswitching by the use of different pins in the different plug-in coils. No bandswitch as such was necessary. The third model, in 1925, had the condensers ganged to a single control. There was finally a model with AC tubes marketed after Lowry left in 1927, but with limited success.

A variation about which Lowry seems to have forgotten, or perhaps of which he was unaware after his departure, was the Mercury Super Power Ten. This was advertised in the 1929-30 catalog, and was the same superhet tubed with eight 201-Cs and either 112-A or 171-A push-pull output tubes. This configuration was offered either as a battery set, or with a power adapter as an electric set.

The company had continued to offer the Mercury to a point where it was clearly no longer a current design. More important was the company's loss of Mr. Lowry in 1927, over a dispute in which they had at first refused to convert the Mercury to use the new McCullough AC tubes manufactured by Rogers in Canada [6]. In total, more than 7000 Mercury sets were sold.



Mercury Mantel Set, 1931

It is interesting to speculate whether the H.M. Kipp Company may have ceased development of the Mercury because they were using patents for which they were not licensed, as was the case with W. W. Grant in Calgary [7]. Lowry reports that they were indeed sued for patent infringement by the patent pool formed in 1926 under the name of Canadian Radio Patents Ltd. This group represented Canadian Westinghouse, Northern Electric, Canadian General Electric, Canadian Marconi and Rogers [6]. He recalls that in his examination for discovery, he reported that at least four of the patents cited against the H.M. Kipp Company were in dispute elsewhere and would risk being revoked if the case came to court in Canada. The suit was withdrawn and the patent pool allowed H.M. Kipp Company to continue to operate, on the condition that the circuit schematics of the receiver would not be published. The schematic was subsequently published in the service manuals of the Radio College of Canada, but presumably after production had ceased.

The next offering of the H.M. Kipp Company was what we now refer to as a cathedral. It was labelled the Mercury Mantel Set in the Radio College of Canada manuals, and the Mercury Jr. in newspaper advertising. It was in a wooden cabinet of not very charming design. Furthermore, this manufacturer with six years of experience in the production of superhets was now offering a TRF. It was an electric set of undistinguished design.

My specimen had been submitted to a couple of highly intrusive repairs, but still it was evident that the original workmanship had been barely adequate.

Another strategy tried by the H.M. Kipp Company in 1931 was to market a ready-made receiver, the Echophone S5, likely suggesting that their own cathedral had not been a great success. On the back of the S5, co-existing with the Echophone labelling indicating manufacture in Waukegan, Illinois, the Kipp Company used their remaining supply of identification plates. My S5 therefore also states that it was made in Toronto by the H.M. Kipp Company Ltd. Oh well, at least it's a superhet.

At the end of 1931, the H.M. Kipp Company was soliciting dealer franchises in a radio trade magazine, and advertising a series of console models, including one model with shortwave as well as standard broadcast coverage and using 12 tubes (well, 11 tubes and a "voltage regulator"). Tube types 224 (1), 227 (3), 235 (4), 247 (2) and 280 (1) were used. In the same issue of the magazine was an article by Herbert W. Kipp (son of the founder), warning that customers would find the reception of shortwave broadcasts a challenging and unreliable pursuit [8]. The 1931-32 models were not shown in the Radio College of Canada manuals, and apparently were the last of the company's radio offerings.

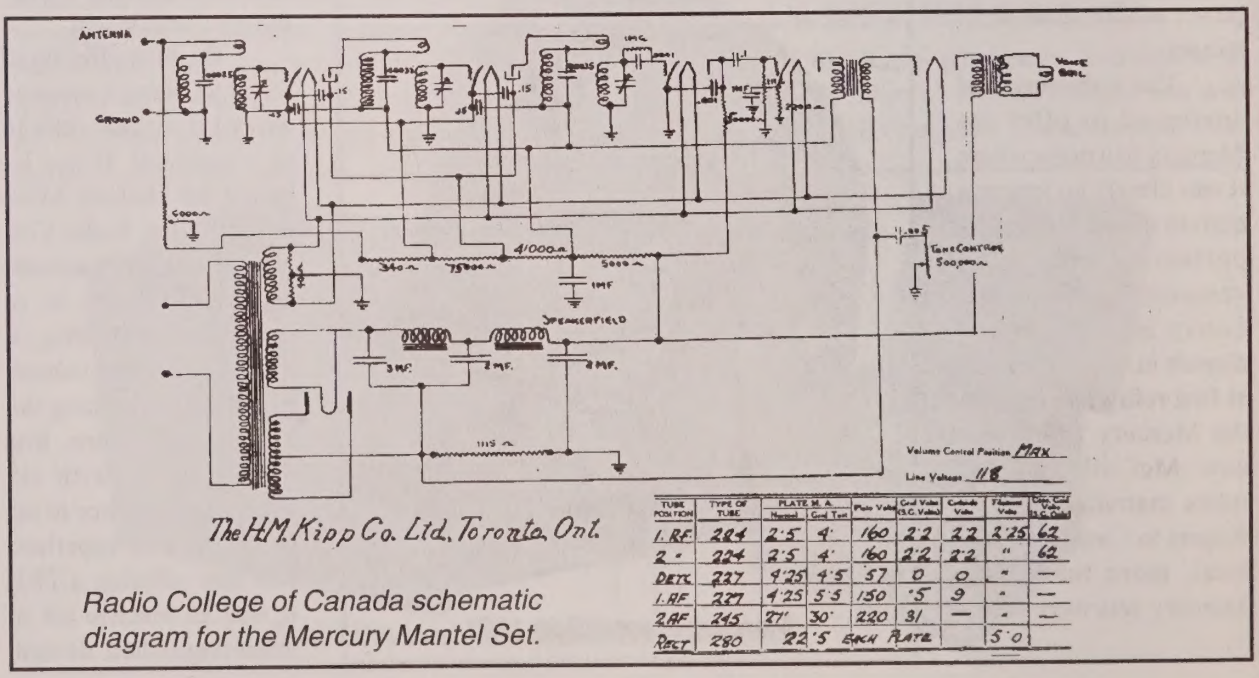
CHARLES A. LOWRY AFTER THE MERCURY

Mr. Lowry went on to a distinguished and varied career as an engineer. From his resumé, the following is a summary [5]:

- 1927-33 — Plant radio engineer, De Forest Radio Corporation of Canada.
- 1933-35 — Chief engineer, Polymet/Aerovox of Canada.
- 1935-39 — Product engineer, Stromberg-Carlson, Rochester, NY.
- 1939-40 — Production engineer, Stromberg-Carlson (Australasia), Sydney, N.S.W.
- 1941-42 — Engineer, Syme, E. S. M. Pty. Ltd., Sydney, Australia.
- 1942-44 — Project engineer, Commonwealth Aircraft Corporation, Sydney.
- 1944-45 — Engineer, Philips Electrical Industries of Australia Pty. Ltd., Sydney.
- 1945-51 — Examiner of patents, Commonwealth Patent Office, Canberra, A.C.T., Australia.
- 1952 — Patent writer and consultant, Marsden and Bromley, Patent Attorneys, Toronto, Canada.
- 1953-1971 — Advanced planning engineer, Philco Corporation of Canada, Ltd., Toronto.

Charles Lowry retired from Philco at age 76. One of his last projects there was as systems engineer and project coordinator for the development of automatic alignment testing for auto-radio production. The following is a memo written by Gerry Bruun,_ Manager of Engineering [5]:

"With the completion of the above project, it would seem appropriate to acknowledge in a special way the major contribution which was made by the senior member of the engineering team. Mr. C. Lowry had been assigned to this very complex project as the advance planning and the electro-mechanical systems engineer, for a period of about 1-3/4 years (1968/69). Mr Lowry designed nearly all the mechanical parts and assembly layouts for this equipment. Moreover, he physically produced a great many of these parts in the shop and he almost single-handedly assembled the original prototype. In view of his age (74 years) this was an exceptional achievement, which he accomplished with such remarkable vigor and effi-



TUBE POSITION	TYPE OF TUBE	PLATE M. A. Normal	PLATE M. A. Grid Test	Plate Volts	Grid Volts (S.G. Volts)	Cathode Volts	Filament Volts	Osc. Grid Volts (S.G. Volts)
1. RF.	224	2·5	4·	160	2·2	2·2	2·25	62
2 "	224	2·5	4·	160	2·2	2·2	"	62
DETC.	227	4·25	4·5	57	0	0	"	—
1. IF.	227	4·25	5·5	150	·5	9	"	—
2 IF.	245	27·	30·	220	31	—	"	—
RECT.	280	22·5 EACH PLATE					5·0	

Radio College of Canada schematic diagram for the Mercury Mantel Set.

ciency that a younger man would be hard put to do better."

Throughout his long career Lowry had apparently given less attention to profit considerations in favor of his striving to solve technical problems. Sometimes, if his sense of the technical requirements of a situation clashed with the ideas of those around him, he would move elsewhere [9]. Charles Lowry remained an active radio amateur until he died in 1976 at the age of 81. To the end he was highly regarded as an innovative engineer, and a dedicated friend to those close to him.

ACKNOWLEDGMENTS

My thanks to Dr. Charlie Fisher, enthusiast of early Canadian superhets, for his comments on this article, and to Bob MacIntyre and Roy Sawley who provided helpful information. Special thanks to my finder of obscure artifacts of early Canadian radio history, who shall remain anonymous.

REFERENCES

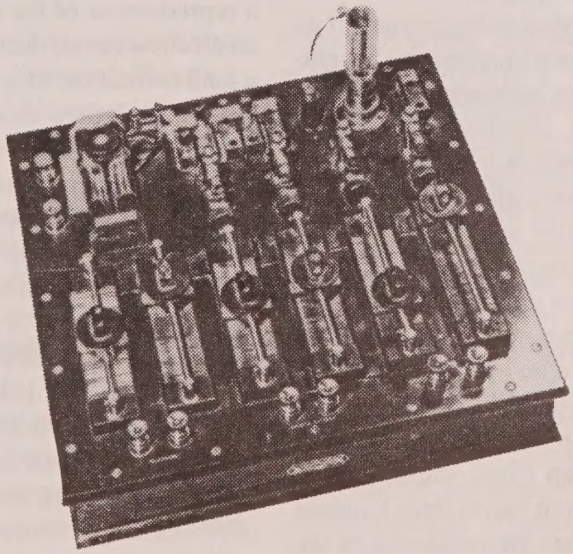
1. - , "The Story of the Mercury Super-Ten," *Radio Informer,* October, 1925.
2. Allen, R., "The Mercury Super Ten," *OTB,* Vol. 26 No. 3 (Dec. 1985), pp. 18-19.
3. Patterson, D., "The Story of Mercury Super 10," *Radio Age,* Vol. 15 No. 5 (1990), pp. 1-3.
4. Rhodes, C. "Project Mercury: The Restoration of a Mercury Superhet," *Radio Age,* Vol. 15 No. 5 (1990), pp. 5-7.
5. Millen, T.I., Eulogy: "Charles Lowry," *The Cat's Whisker,* Vol. 7 No. 1 (1977), pp. 4-6.
6. Lowry, C.A., letter to Mike Batsch Re: Mercury Super Ten, The Cat's Whisker, Vol. 6 No. 3 (1976), pp. 4-8.
7. Murray, R.P. "The Voice of the Prairie: A Brief History of W.W. Grant (1892-1968)," *OTB,* Vol. 33 No. 3 (Aug. 1992), pp. 16-19.
8. Kipp, H.W., "Pioneer Short Wave Manufacturer Says Dealers Should Not Promise Too Much," Radio Sales, Vol. 8 No. 12 (1931), p. 12.
9. Challoner, D., Editorial: Charles A. Lowry, *The Cat's Whisker,* Vol. 7 No. 1 (1977), p. 3.

EQUIPMENT IN AWA MUSEUM: RARE MARCONI DETECTOR

This extremely rare detector, one of the many Marconi artifacts on display in the AWA Museum, was made by the British Marconi Company about 1908 and restored by Linc Cundall in 1964. It gave the commercial wireless operator a choice of four mineral detectors and a Fleming valve. A selection was frequently necessary: certain detectors were unreliable and some types were considered more favorable than others under particular conditions.

Seen at upper right is a Fleming valve with the four mineral detectors in front of it. The six sliding potentiometers were to give each detector a DC bias and control the filament voltage on the tube. At the upper left is a "billi" variable condenser. As was customary for the period, the tuner was a separate unit with long-wave tapped inductances and variable condensers.

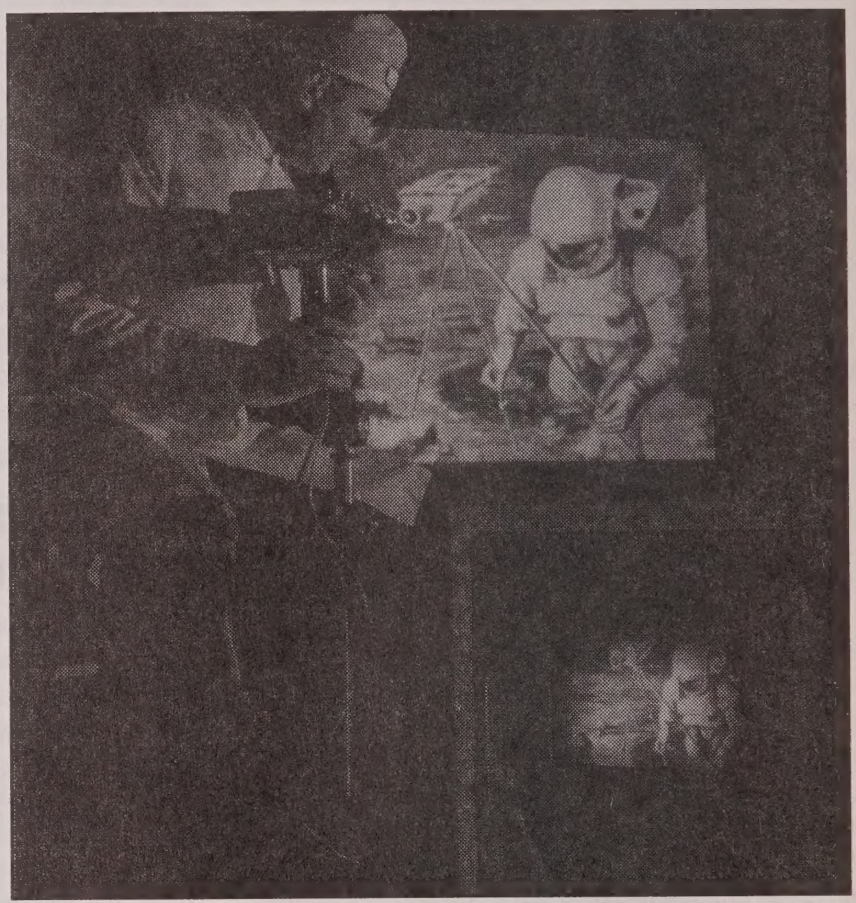
The metal nameplate is inscribed *Marconi's Wireless Telegraph Co., Ltd., London.* [BK]



HISTORIC TV CAMERA ABANDONED ON THE MOON

Richard Brewster
454 Diablo Drive, Pittsburgh, PA 15241

As you read these words, there is a television camera resting on the moon, unpowered and unseeing; awaiting the return of astronauts who will someday come for it! Twenty-five years ago this seven-pound Westinghouse-designed camera accompanied man as he embarked on this most perilous journey — Apollo 11. There it was called upon to televise to the waiting earth, our first steps onto another world. It did just that, in "real time," and in vacuum-tube technology's finest hour, proved that the 10-year effort to land man on the moon was a success.



The Westinghouse-designed television camera that was carried to the moon by the Apollo 11 astronauts.

The basic research, of course, began back in the 19th Century when cathode-ray tubes were a scientific curiosity. In the 1920s, under Vladimir Zworykin's direction at the Westinghouse Research labs, the CRT became an iconoscope. Almost 40 years later, an image tube, the secondary-electron conduction (SEC) vidicon, was born at the Westinghouse labs [see photo on next page].

The features of this amazing device made it an excellent candidate for the moon mission: small, lightweight, having both low power consumption and high sensitivity. The SEC vidicon, like most image tubes, has a photoelectric surface which releases electrons when impacted by lens-focused photons [see figure on next page]. These electrons are accelerated and imaged on a positive target which consists of an aluminium oxide film deposited on an aluminum surface, each of which is only two millionths of an inch thick. The rear surface of the aluminum is coated with a "thick (one-thousandth of an inch), fluffy" layer of potassium chloride. Each photo-emitted electron passes through the aluminum films, impacting the KCl layer and causing it to emit two to three hundred secondary electrons. These are then collected by the positively charged aluminum film.

The resultant positive charge pattern, which is a reproduction of the original image, is scanned by an electron beam, discharging the KCl layer through a load resistance, thus creating the video signal.

The camera electronics are conventional, although extensive use was made of newly developed integrated circuits. Great consideration was given to power requirements and heat dissipation, especially since the unit had to operate in an ambient environment ranging between -300° and +250° Fahrenheit!

Since the bandwidth of the video signal had to be limited to 500 kHz, the scanning was only 10 frames per second with 320 lines. This was converted to broadcast standards after reception on earth. For scientific purposes, the camera had a slow-scan mode of 5/8 frame per second with 1,280 lines.

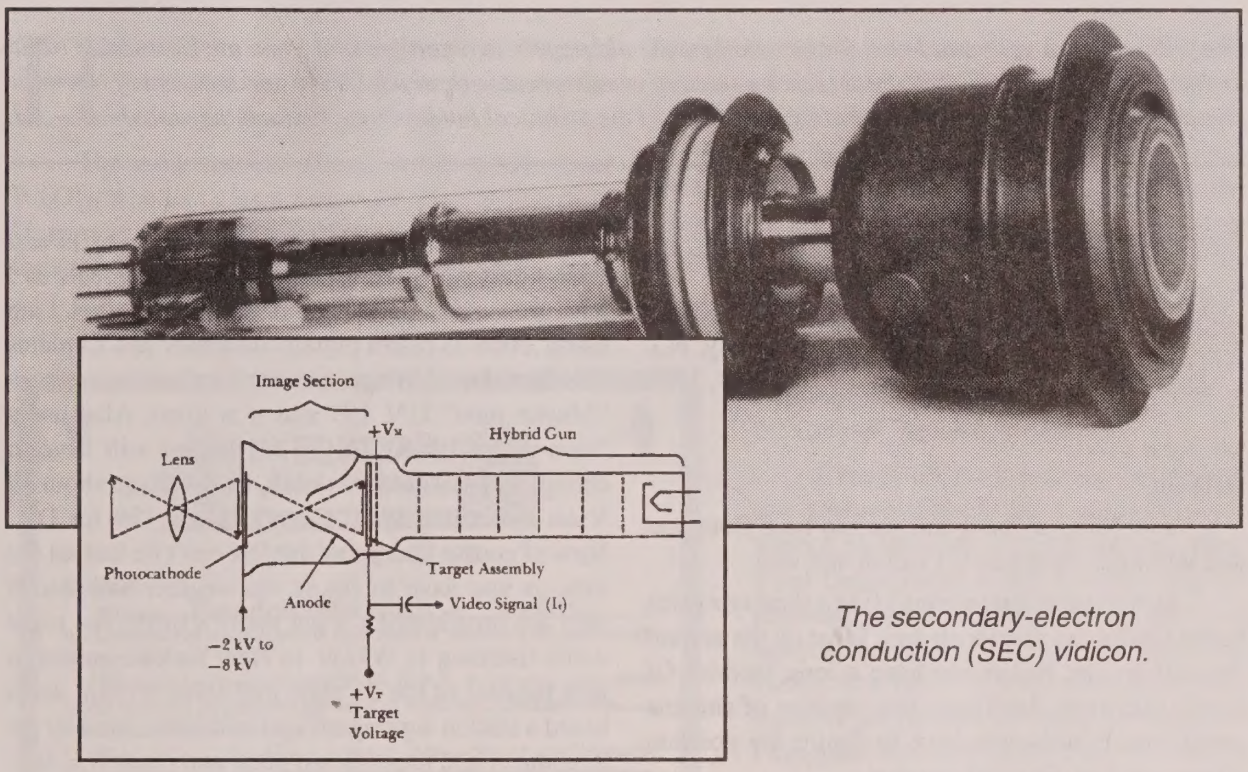
There were four interchangeable lenses but, aside from the scanning mode switch, no controls. A

specially designed connector and case completed the package.

Eight other missions to the moon were completed into late 1972, all using similar video cameras. Color transmissions were also accomplished using a color wheel in front of the SEC vidicon.

Future voyages into the solar system and beyond will surely involve television, but the vacuum tube will likely never again play a part.

I want to thank Drs. John Coltman and Richard Hanson for the documentation used to develop this article.



The secondary-electron conduction (SEC) vidicon.

HEADPHONE SAFETY

Richard W. Mackiewicz
1549 North Rover Road, Coventry, CT 06238

If you're using headphones with a crystal set, your main safety rule should be: "Remove Phones in Event of Electrical Storm." However, if you're using phones with a tube set, the situation is entirely different.

In many instances, high voltage is present on the cord and other phone parts. If you use phones with an AC-DC set, one side of the line may be in close proximity to the old "noggin." Brandes NHI phones connected the third (ground) wire to metal receiver cases. There are others.

If you are using phones with exposed terminals, metal receivers, frayed cords, metal-shell plugs, or adapter plugs with exposed terminals, **please** heed the following: replace the frayed cord. (Put the old one in a plastic bag, label and save it to preserve the phones' originality.) Discard the metal-shell plug. Chrome is pretty; Bakelite is much safer. If using an adapter plug such as a Weston, wrap some plastic tape around the exposed tabs. Insulate exposed lugs, tips, and terminals with shrink tubing, brush-on insulation, or RTV silicone rubber. You can safely remove any of these to restore originality.

Examine the interior of your phones. Ensure that terminals cannot short against other metal parts. Check tips on Western Electric and other phones where tips enter receivers. Receptacles can shift allowing tips to contact receiver cases.

Never connect phone tips to a receiver with the power on. Use a 1:1 transformer on AC-DC sets. The safest phones are those with nonmetal cases and enclosed terminals. If yours do not match that description, follow the advice in this article and make them — and yourself — a whole lot safer.

BROADCAST DX AND THE "RADIO CRAZE"

The following is a yellowed letter, found among some old papers in a garage, sent from one East Coast radio enthusiast to another in 1925. It hints at the spirit of wonderment with which DXers and builders of one-tube sets approached the new "radio" hobby, and some of the technical folklore under which they labored. — Ed.

Thur Friday and Sun night best for DX

78 Clifton Place
Jersey City, N.J.
April 3, 1925

Mr. John -----
Dear Sir.

Your letter at hand and glad to hear from you and willing to help you if I can in any way.

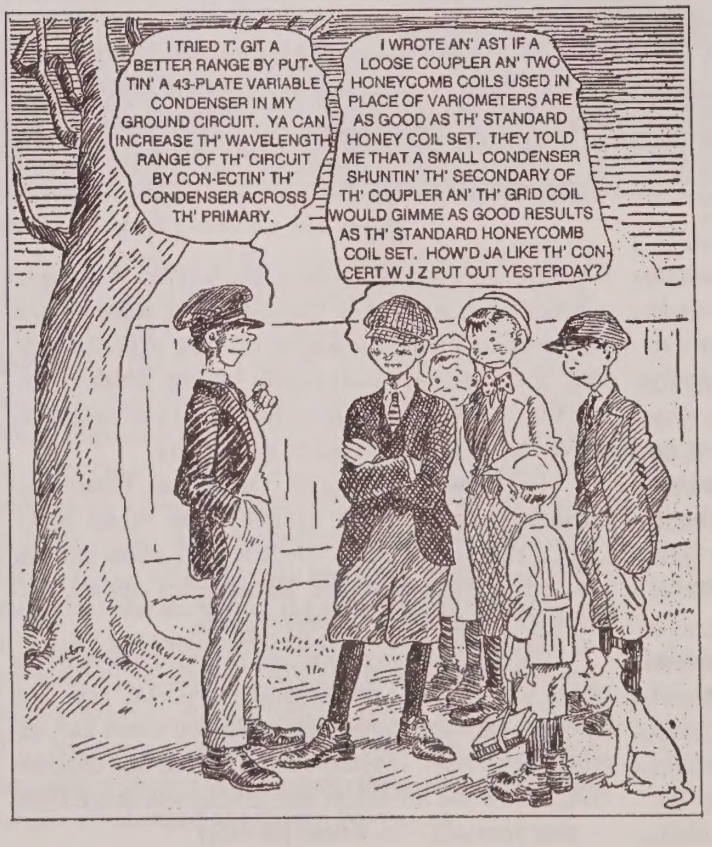
In the case of the antenna I find a short one gives better results say thirty five feet. I live on the second floor of an apt. house and have a long lead-in. Of course you must also figure that position of antenna counts too besides you have to figure the position where you live. So much for that.

Now I had a W.D. 12 R.C.A. and got Chi and Cinn but it was hard to squeeze thru the locals as I have Newark on one side and N.Y. on the other. I am using .0005 23 plates pigtail condenser and 13 plates .00028 as I couldn't get another 11 plate. Am using a "Master tube" U.V. 199 and it is great. Also use a "turn-it" grid leak. To use a 199 you will have to change Reostat get thirty ohm. Low voltage about 19 V on B if using W.D. 12 and 22° on 199 for DX. Now of course you know the DX can't be had all the time as you have to figure the weather and also if they are broadcasting. I get many a thrill; last night while listening to W.H.N. in New York happened to turn the dial of the 23 plate just about a point and I heard a station signing off and told us to stand by for announcer and then I heard good and plain W.E.B.E. Tidewater Hotel Chicago, Ill. You will find if you hunt around that a lot come in on the low side say from the place you get W.A.H.G. to Newark W.O.R. and also in around W.H.N.

I had another set I put together this week but so far have not much to say about it. I was at it last night but only got locals and not all at that, so got my other working on the job again. Now you can see myself — and I don't know any more than the man in the moon about radio — can get results and then get stumped.

Are you using a variable resistance called a Clarastat [sic]. They are built for the set. Hoping you have success in the near future and don't throw the set out as I came near doing one night about a month ago.

Yours truly in sport
Joseph -----



Left: "The Owners of Radio Phone Spring Some Technical Stuff for the Benefit of the Layman." Thanks to Bill Fizette for this cartoon from the old New York World.

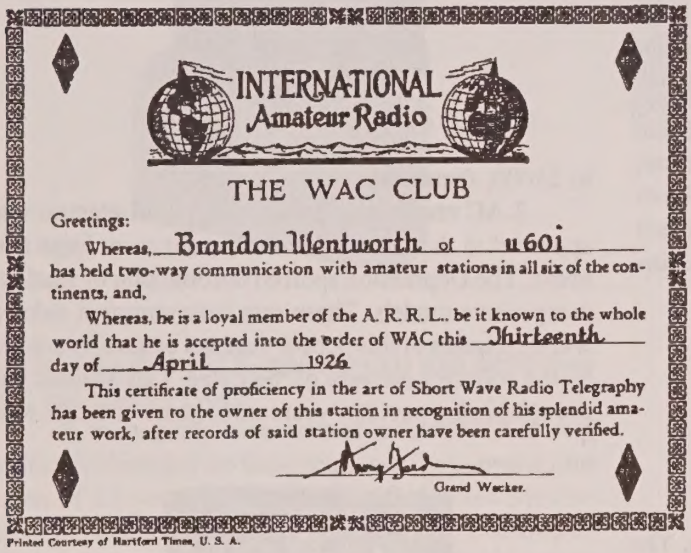
THE FIRST WAC CERTIFICATE

Dick Barrett, W6CFX

Reprinted from the Northern California DX Club's *DXer,* May 1989

Herewith is a copy of the first WAC (Worked All Continents) certificate ever issued by the American Radio Relay League.

The recipient was Brandon Wentworth (later W6OI), who had a ham station on a hill at Stamford University in California, where he was a student at the time. He was a member of the Santa Clara County Amateur Radio Association, which was founded in 1921 and charged with "control" of the air in the country. (A ham reportedly wrote to J.I. Dillon, the Radio Inspector, inquiring why his license hadn't come through, was told he would have to have a letter of approval from the San Jose Radio Club, later SCCARA.)



INTERNATIONAL
Amateur Radio

THE WAC CLUB

Greetings:

Whereas, Brandon Wentworth of u6oi has held two-way communication with amateur stations in all six of the continents, and,

Whereas, he is a loyal member of the A. R. R. L., be it known to the whole world that he is accepted into the order of WAC this Thirteenth day of April 1926

This certificate of proficiency in the art of Short Wave Radio Telegraphy has been given to the owner of this station in recognition of his splendid amateur work, after records of said station owner have been carefully verified.

Grand Wacker.

Printed Courtesy of Hartford Times, U. S. A.

The idea of a WAC certificate was conceived by Col. Clair Foster, W6HM, of Carmel, who hoped to be the first winner. Foster was an officer of the Corps of Engineers in World War I who achieved wealth in civilian life as a mechanical engineer with a patented method of scaffold construction for building projects. As a ham, he was active in the Transpacific Association which handled a large volume of traffic between the U.S. and the Philippines, which were then an American dependency.

When WAC was inaugurated, Foster had all the requirements except for a card from a Swedish ham he had worked, one he never received, and this let Brandy Wentworth into the No. 1 spot. The latter turned in cards from Melbourne, Australia; Rio de Janeiro, South America; Saigon, Asia; and Essex, England. The last one was the clincher because Europe was then difficult to work from California. Because some hams did not consider England as a part of Europe, Brandy submitted a backup card from France. Whether the signature of "Henry Ford," as "Grand Wacker" on the certificate was the inspiration of F.E. Handy, the ARRL Communications Manager in Hartford, or the Colonel himself, is unknown.

Clair Foster went on to become the second director of the ARRL Pacific Division, when A.H. Babcock, who was with the Electrical Department of the Southern Pacific Railroad, was ousted in a West Coast revolt against the ARRL, led by SCCARA and Foster. One point of contention was Headquarters' revocation of voting privileges of Philippine members of the Pacific Division on the ground that ballots could not be received in time to be counted in Hartford. Foster's view was that they could be counted in Manila and the results radioed to Headquarters. Stalwarts like Frank Quement, Harry Engwicht and other campaigned for the ouster of K.B. Warner, Secretary of the League, for this and other reasons, but the Westerners were regarded as wild revolutionaries in the East and there were too many votes back there to overcome.

Foster and Brandy were good friends, and with Harry Engwicht, Orrin L. Brown and Phil Scofield, made headlines by working the world (except for Europe) from Lick Observatory east of San Jose in the spring of 1926. Scofield joined Brandy in operation of the Stanford station as "engineer."

Brandy died in 1987. His wife provided a copy of his WAC certificate.

[Wentworth's certificate is printed in the June 1926 issue of *QST,* pg. 54, with a picture of his transmitter (a "250-watt" tube) and a report of his making first-time contacts with 01SR in Rhodesia and a station in Java. The "International Amateur Radio" artwork was a column header in the same issue. Other recipients were listed, probably in time sequence, as u6HM, u1AAO, c4GT, pr4SA, u9ZT-9XAX (the famous DXer Don Wallace), b4YZ, and gi5NJ. —Ed.]

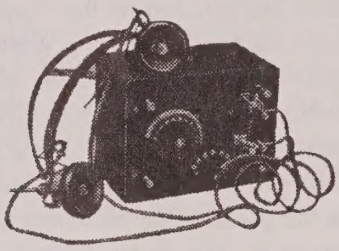
INTRODUCTION TO COLLECTING EARLY RADIO RECEIVERS

Bruce Kelley

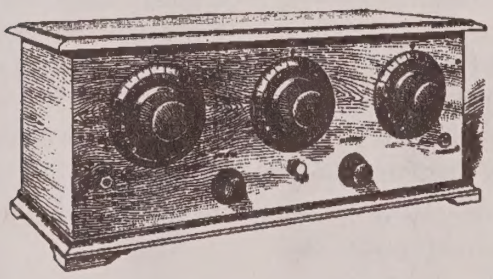
Although some individuals began collecting early radios in the 1940s, it wasn't until 1952 that the first collectors' club was organized. Today there are two national and about 30 quasi-national, regional, or local clubs. Interest is primarily focused on tube-type broadcast receivers, although interest in early transistor radios and television sets has developed in recent years.

Receivers can be broken into eight general categories:

1. Factory-made crystal sets. Although originally the least expensive, these are now commanding the greatest increase compared with original price. Sets that once sold for $5 and $10 now sell between $150 and $300.

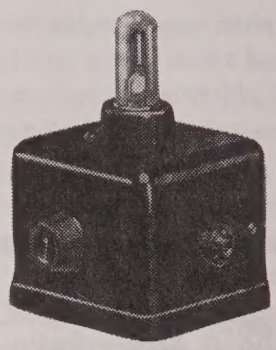


2. Battery receivers made in the 1920s. The most common are "three-dialers" with five tubes. Different manufacturers made these sets by the hundreds of thousands, with peak production between 1925 and 1926. Oddly enough, a 1925 sale price of $30 to $60 has changed little after 65 years, with the exception of



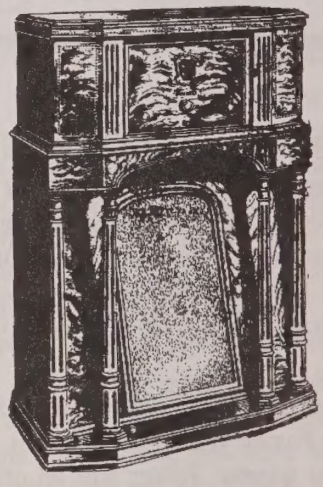
early Grebe, AMRAD and Federal sets, which command high prices.

Another oddity is that early battery receivers with fewer tubes are frequently of greater value today. Two-tube Crosleys sell for four times their original sale tag while the $10 Crosley one-tube "Pup" is now bringing $200! Exceptions to this are rare superheterodynes such as Leutz and Atwater Kent breadboards. These sets are very popular with collectors and sell for $400



to $1000, depending on the model.

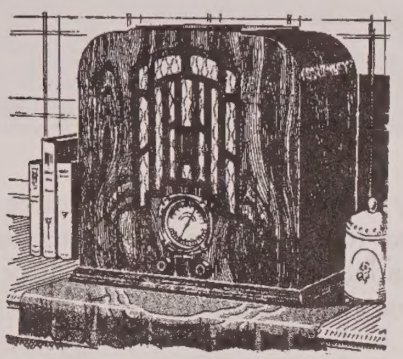
3. AC receivers. Mass-produced, all-electric sets appeared in the late 1920s. Early ones were large and heavy. The Depression spurred introduction of smaller, inexpensive models. These sets have marginal values, while consoles of this period were not originally sought by the collector because of their size. This attitude has changed in the past few years since some consoles rep-



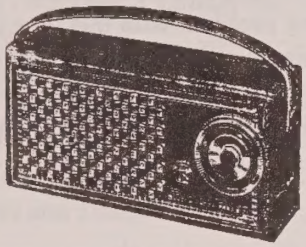
resent fine pieces of furniture. Scott and McMurdo Silver are top of the line consoles, followed by certain model Zenith, Philco and Stromberg-Carlson sets.

Collectors are seeking three broad types of AC table receivers: (a) cathedral-shape models from the early Thirties in wooden cabinets, with Philco being the most popular; (b) Catalin sets with art deco styling in a cast-plastic cabinet recognizable by vivid colors; (c) novelty receivers — small table sets made in

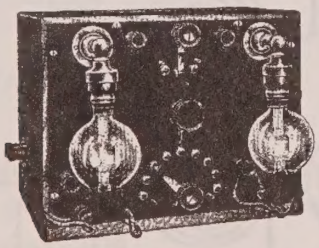
bottles or globes, or with special "personality" features such as Charlie McCarthy.



4. Transistor radios. Although most recent and least expensive, there has been an increasing interest in small pocket radios made in the '50s and '60s, especially the earlier U.S.-made models with metal chassis, and novelty types.

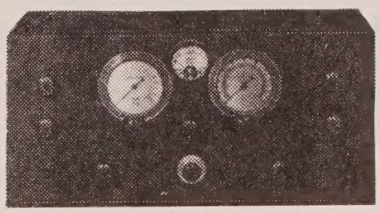


5. Very early commercial receivers. It is very difficult to categorize these sets since they cover a time span of 25 years (1900-1925) with limited production, not intended for public consumption. Certain pre-WW I Marconi receivers are in the $10,000 range.

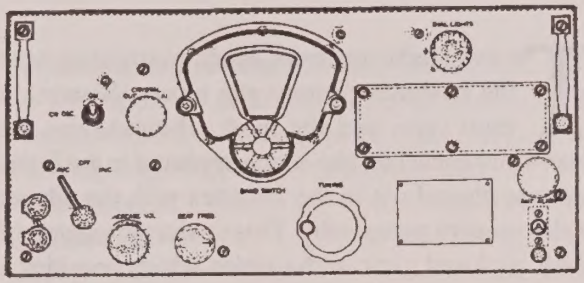


The odds of finding one of these sets in a flea market are very remote, but there are always exceptions.

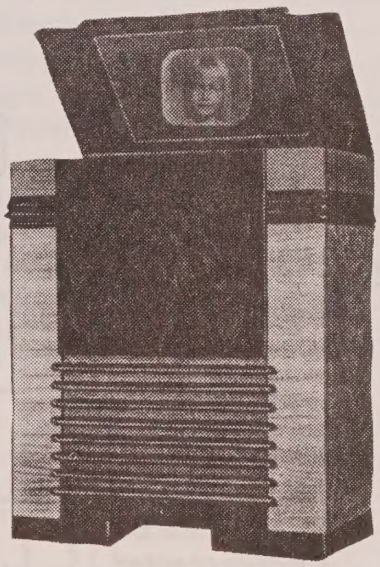
6. Amateur SW receivers. Radio amateurs are collecting sets manufactured between roughly 1930 and 1960, with National products receiving the greatest attention. The three-tube SW-3 is a hot item.



7. Military receivers. Radio equipment for Army or Navy use has always been collectible. Receivers of WW II or Korean vintage are still available at reasonable prices, although they are most desirable if postwar modifications are absent or can be removed. Foreign sets and spy receivers are hot items.



8. Television receivers. TV sets can be broken into two distinct groups. Mechanical disc scanners made between 1928 and 1932 are very rare and command high prices. The other group is tube sets made just before and after WW II. Some of the prewar sets, like the RCA TRK-12 mirror-in-the-lid model, are in the $2,000-$3,000 range. Postwar receivers range in value from $50 to $400. The little 1949 Pilot 3-inch



set, originally sole for $99.95, is currently bringing $150-$300. TV receivers made after 1949 have relatively little value except for the first color sets (1954-55), and the Philco Predicta models of the late Fifties.

The value of a receiver can vary dramatically, depending on condition of the cabinet and electrical operation. Without a radio background, restoring a receiver electrically can be frustrating. Fortunately, several individuals advertise schematic diagrams for old sets at nominal prices. Finding 50- to 60-year old replacement parts can be a challenge, but collector flea markets and specialty firms often have what's needed.

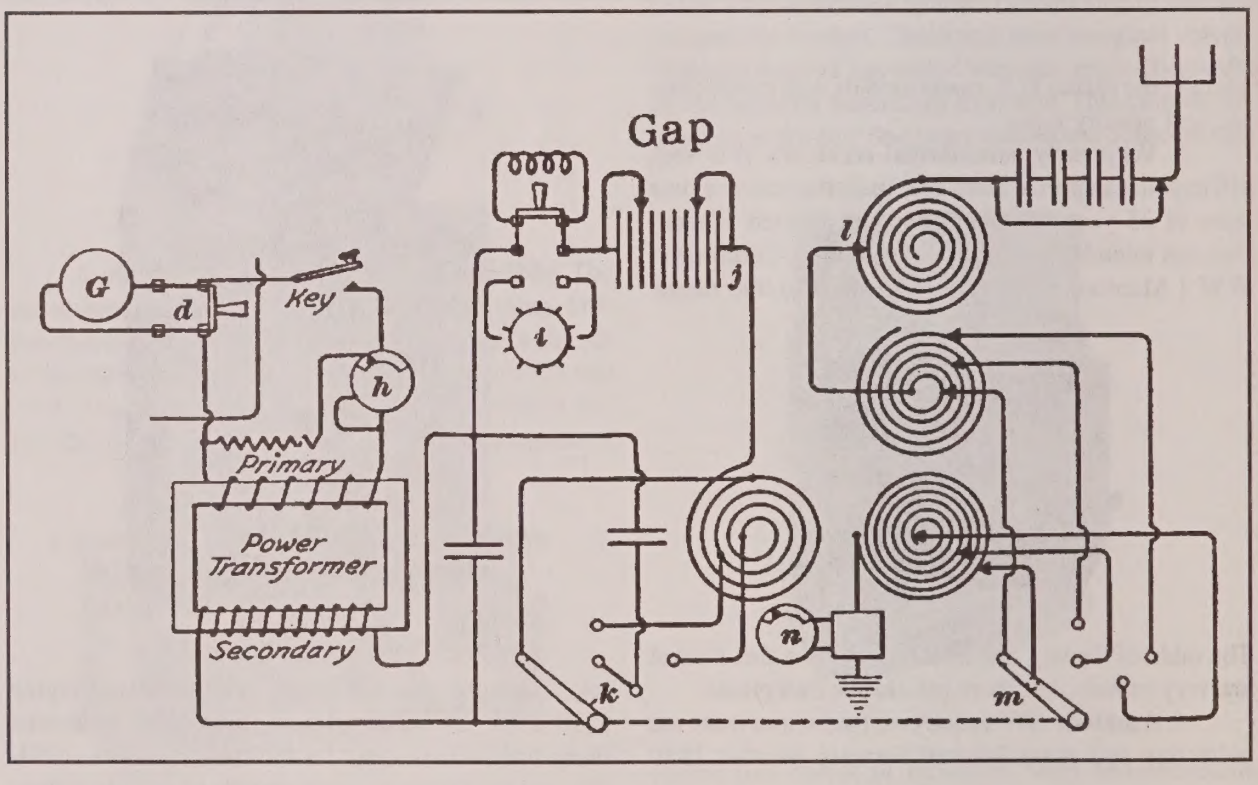
QUENCHED-GAP SPARK TRANSMITTERS

Bruce Kelley, W2ICE
59 Main Street, Bloomfield, NY 14469-9336

To most radio amateurs, spark transmitters were the straight or rotary gap types. However, a third type, and the most efficient, was the short-lived quenched gap which appeared in the Teens and was phased out in the Twenties with the advent of the vacuum power tube. This device is a group of small enclosed gaps in the series which provides a quenching action, i.e., quick deionization.

The AWA Museum has two commercial 1-kW quenched-gap transmitters: an American Marconi and an Independent Wireless with a Crocker-Wheeler 500 Hz motor-generator. In addition, a working ˇ-kW Amrad amateur set is used for demonstration purposes.

The diagram shows a typical °-kW commercial transmitter used on small vessels. A DC motor, powered by the ship's 110-volt supply, drives a 500-Hz generator (G). As with most spark transmitters, keying is in the primary of the high-voltage transformer. A unique feature of this set is the alternate rotary gap. As noted, there are four RF inductances: primary: secondary, and two antenna coils. These transmitters were always pre-tuned between 300 and 800 meters (375 to 1000 kHz) with 600 meters (500 kHz) mandatory. The quenched gas was more efficient than the rotary and gave a nice musical note with the 500-Hz power source giving 1000 sparks per second. One problem with this type of transmitter is the occasional need to disassemble the gaps for cleaning. On your next visit to the association's museum, let me show you the Marconi 1-kW set and its unique tuning system.



INDEX TO THE AWA REVIEW

CONTENTS

AWA I-1
Biographic Notes I-1
Collections I-1
Histories - Manufacturers I-1
Histories - Operating Companies I-2
Histories - Technical Development I-2
Keys I-2
Loudspeakers, Microphones I-2
Operations - Broadcasting I-2
Operations - Amateur, Commercial, Experimental, Military I-3
Receivers and Amplifiers - Broadcast I-3
Receivers - Communications and Wireless I-3
Stations - Radio, TV, and Wireless I-3
Telephone and Telegraph I-3
Transmitters and Transceivers I-4
Tubes I-4

This index covers the eight volumes of the *AWA Review*. Citations are given by volume and page (for example, "2-21" designates page 21 of Vol. 2).

An item listed may vary in size from a passing mention to a major feature. *Italic type* indicates an item of a full page or more; **bold type** indicates coverage of three or more pages. With the idea that bits of information may be useful, the listings are in fairly fine detail. — LAS

AWA

History of AWA and its Museum **1-7**

BIOGRAPHIC NOTES

(See "Histories - Technical Development" for patent listings for individuals.)

Alexanderson, E.F.W. **3-12,** 4-9
Apgar, Charles **5-21**
Armstrong, Edwin **1-110, 6-97**
de Bardeleben, John *5-97*
Bingley, Frank 4-101
Cadmus, R.Y. 2-132
De Forest, Lee, radiotelegraph companies **2-6**
Dubilier, William *3-67*
Dunmore, Francis **3-61**
Dushman, Saul 4-7
Duvall, Ted 6-2, 8-121
Elwell, Cyril 1-14, 7-129
Farnsworth, Philo **1-42**
Fessenden, Reginald A. 4-8
Bibliography **8-55**
Fetsch, Joseph T. 8-109
Fleming, John Ambrose 7-30
Fuller, Leonard 1-15, **7-120**
Goddard, Robert 7-151
Godley, Paul, interviewed **1-117**
Hammarlund, Oscar *2-94*
Herold, Edward **7-15**
Houck, Harry *3-67*
Hubbell, Burt G. 8-71
Hull, Albert 4-7
Kent, A. Atwater ..... **1-82,** 2-134 (pic)
Kolster, Frederick 8-91
Langmuir, Irving 4-6
Laüt, Paul 6-97
Lévy, Lucien 6-97
von Lieben, Robert **5-45**
Lowell, Percival D. **3-61**
Mignon, Ernest **3-79**
Millen, James **1-69**
Reisz, Eugen 5-51
Sebold, William *5-81*
Stone, John Stone, On Tesla *1-19*
Tesla, Nikola **1-19**
Tuska, Clarence **1-49**
Wheeler-Hill, Alex *5-85*
White, Abraham 1-8
White, William 4-6

COLLECTIONS

Eaton, Lt. W.A. - WW I tubes **6-1, 7-107**
Fetsch, Joseph - tubes **8-109**
Paquette, Bob - microphones *4-154*

HISTORIES: MANUFACTURERS

Adams-Morgan 1-120
Amalgamated Wireless Australasia **6-128**
Atwater Kent **1-83, 2-21,** 2-123, 3-6
Australia, tube makers **6-125**
Barker & Williamson 2-127
Century Electric Co. **8-67**
Chambers, F.B. *2-121*
Collins Radio Co. *7-154*
De Forest Radio Tel. & Tel. Co. **6-13**
Dubilier Condenser Co. **3-67**
Federal Radio Laboratories 8-72
Federal Telegraph Co. **7-119, 8-75**
Federal Tel. & Tel. Co., as telephone maker **8-67**

General Electric
Considers buying De Forest **6-13**
Early tube R & D at **4-6**
Microphones **4-145,** 7-17
Supplying tubes, sets, and people to RCA **5-1**
Hammarlund **2-95**
Heintz & Kaufman *7-154*
Magnavox *4-139*
Mignon Wireless Corp. **3-79**
Mignon Manufacturing Corp. 8-91
National Co. **1-65**
National Electrical Supply Co. **8-117**
Nems-Clarke 8-117
Philips (Australia) **6-125,** 7-66
Philco *2-125*
TV development at **4-99**
Poulsen Wireless Tel. & Tel. Co. **8-75**
RCA/RCA Victor *2-126*
Microphones *4-149*
Radiotron Div. *7-16*
STC (Australia) **6-125,** 7-66
Universal Radio Corp. *3-90*
Western Electric, tubes **4-45**
Westinghouse, microphones *4-142*

HISTORIES: OPERATING COMPANIES

American Wireless Telegraph Co. 2-128
American Marconi **6-19**
AT&T *4-45*
Competing with independent telcos **8-67**
De Forest Radio Telegraph Cos., 1907-20 ..... **2-6**
Federal Telegraph Co. **8-75**
in Hawaii **6-19**
Federal Tel. & Tel. Co., as a telephone co. **8-67**
Frontier Tel. & Tel. Co. **8-67**
Globe Wireless 8-99
Hawaiian Islands, wireless **6-19**
Inter-Ocean Tel. & Tel. Co. 8-70
KFS World Telecommunications **8-75**
Mackay Radio **8-75**
Mutual Telephone Co. **6-19**
Poulsen Wireless Tel. & Tel. Co. **8-75**
Press Wireless 8-99
RCA, in Hawaii 6-19

HISTORIES: TECHNICAL DEVELOPMENT

Patent Listings

Alexanderson, E. F. W. **6-156**
Armstrong, Edwin *5-143*
Carson, John R. *6-168*
Colpitts, Edwin H. *6-169*
Conrad, Frank **5-146**
De Forest, Lee **5-153**
Davis, Harry P. **6-171**
DuMont, Alan *5-162*
Farnsworth, Philo **5-164,** 7-186
Fessenden, Reginald **5-169**
Fleming, John Ambrose 5-178
Gernsback, Hugo *6-174*
Goddard Oscillator **7-151**
Herold, Edward **7-15**
Hogan, John V.L. *6-175*
Index to patents, personal-name,
Reviews 5 & 6 ..... *7-185*
Kent, A. Atwater **5-178**
Loomis, Mahlon 6-177
Marconi, Guglielmo 5-183
Mignon, Ernest *3-87*
Pupin, Michael *6-177*
Rider, John F. 6-179
Stone, John S. **6-179**
Stubblefield, Nathan 6-184
Zworykin, Vladimir **5-184**

Receiving Equipment

Audio amplifiers, tube **7-91**
Superhet, "Who Invented?" **6-97**

Television

Farnsworth's contributions to electronic **1-43**
Philco, development at **4-99**
United Kingdom, in the **6-37**

Transmitters

Spark engineering, appraisal of **2-21**
Development
Arc **7-119**
Broadcast, by GE **7-159, 8-149**
Spark, at Poldhu **7-29**
Single-sideband, by GE 7-166

Vacuum Tubes

Camera tubes, at Philco 4-104
Development at GE, early **4-6,** 7-160
Development at RCA, '30s **7-15**
Gammatron, Heintz & Kaufman *7-156*
Goddard oscillator **7-151**
Klystrons and magnetrons **7-47**
Picture tubes, at Philco 4-104

KEYS

General

Century of development **2-106**
Foreign and military **3-98, 8-1**
Military, WW II **3-98**

Specific Types

Boston Key 2-115
Camelback types 2-107
European types **3-104**
Hulit Transmitter 2-113
Key & Plug Assembly No. 9 ..... *8-40*
Lever Correspondent 2-106
Signal Corps J-series 3-107, *3-114*
Soviet types *8-31*
Training keys (British) *8-32*
Vibroplex *2-111*

Victor 2-109
W.T. 8 Amp (British) **8-33**
W.T. 10 Amp (British) 8-18
Wireless types 2-110
Yetman Transmitter 2-111

LOUDSPEAKERS, MICROPHONES

Speaker development, 1920-30 ..... **4-84**
Horns **4-85**
Magnetic cones **4-93**
Electrodynamic *4-95*
Microphones, early history **4-131**
Telephone types *4-131*
Pre-broadcast **4-133**
WW I *4-137*
PA units 4-139
Broadcast era **4-141**

OPERATIONS
Broadcasting

Audio-frequency performance in early **3-48**
Crystal control, early *7-173*
GE, chronology *7-182*
Networks
Don Lee - Columbia **5-135**
NBC Orange **5-123**
New York State **3-34,** 7-177
Program transmission and early networks .. **3-34**
San Francisco, network centers of '30s **5-123**
Philadelphia, first 50 years **2-120**
Shortwave, by GE, '20s *7-178*

OPERATIONS
Amateur, Commercial Experimental, Military

Amateur radio in NY City area, pre-WW I **6-115**
Armstrong FM system, Empire State Building trial **1-109**
Feminine touch in telecommunication **4-70**
Radio amateur in WW I, a (Tuska) **1-49**
Radio intelligence
FCC, in WW II **5-63**
Mexican border, 1916 ..... *5-29*
WSL, WW I **5-21**
WW I, military communicatons in **6-125**

RECEIVERS AND AMPLIFIERS: BROADCAST
General

AC Supply, for the Lowell and Dunmore Patents **3-61**
Audio Amps, Tube, History **7-91**
Italian "People's Receivers" **7-1**
Superhet, "Who Invented?" **6-97**

By Maker or Brand

Atwater Kent
AC Models (36 to End) **3-6**
Early Models (5-12) **1-83**
Metal & Mahogany Box Models (20-35) **2-21**
CGE Radio Balilla *7-5*
Fisher 80AZ Amp (pic) 7-102
McIntosh 20-watt Amp (pic) 7-103
McIntosh MC-30 Amp (pic) 7-104
Philco 511 (pic) 2-125
Philco TV for Britain (pic) 4-103
Philips 5926 Amp (pic) 7-102
Quad II Amp (pic) 7-104
Radio Roma *7-7*
RCA Radiola Superhet *5-8*
Shindo Laboratory Amp (pic) 7-106
Stephens 500D Amp (pic) 7-103
Super-Ducon Batt. Eliminator *3-69*
Thordarson 175K-30 Amp (pic) 7-102
Tuska 220, 225 ..... *1-63*
Unda Radiorurale *7-3*
WE 43A Amp (pic) *7-90*

RECEIVERS
Communications and Wireless

ARB (pic) 8-125
BC-SCR-RC Directory **6-49**
Cohen Type A (SCR-46?) *5-32*
Hammarlund
Comet Pro *2-98*
Super Pro *2-98*
HQ-series *2-100*
LRS-Tube Set, SS Vaterland *8-46*
Marconi Quintuple Det'r (pic) 1-14
Mignon, whole line **3-79**
National
AGS *1-74, 4-32*
HRO **1-74**
Early, dating **4-32**
RAS (pic) 8-136
SW-2, -3, -4, -45, 5, 58C **1-72**
Whole line, chart **1-78**
Navy Electronics Directory **8-123**
NESCO, General **8-116**
CN-113A (pic) 9-11
CN-239 (pic) 8-121
CN-3313 (pic) 8-116
SE-1950 (pic) 8-118
RBM (pic) 8-137
Universal Radio Corp., whole line *3-91*

STATIONS
Radio, TV and Wireless

Alexandra Palace **6-41**
Alternator-equipped, table *5-10*
Atlantic City (WBAB, WHAR, WPG) *2-131*
Federal stations, 1916-23 (table) 8-88

Hawaii
1908-17 6-21
Heeia, Federal **6-21**
Kahuku and Koko Head, Marconi/RCA **6-30**
IT&T-Mackay stations (table) 8-88
KET Bolinas *2-50*
KFS San Francisco/Palo Alto **8-90**
MFT Clifden **1-39**
MPD Poldhu **2-33. 7-29**
MUU Carnarvon **2-46**
NAA Arlington **2-43**
Navy Arc stations (table) 8-79
NY Area, 1908-17 (table) 6-116
PJ San Pedro (pic) 6-142
Poulsen Arc stations, 1912 (table) 8-79
WBAY/WEAF New York 3-54
WHD New York 5-41
WCI-WGG Tuckerton *3-132*
WII New Brunswick (pic) 3-131
WQR-WSO Marion 3-135
WSL Sayville **5-22,** 8-89, 8-101
Philadelphia (WCAU, WFI, WGL, WIP, WLIT, WOO, WQAA) **2-128**
POZ Nauen **2-60**
WGY Schenectady **7-161**
200-kW operation **8-149**
W2XAD Schenectady ..... *7-178* (pic), 8-154
W2XAF Schenectady *7-178*
W3XE/WPTZ Philadelphia *4-99*

TELEPHONE AND TELEGRAPH

Bain Facsimile System 6-38
Beardslee Telegraph Set (pic) *3-10*
Buzzer Telegraph, Military 8-21
Federal Tel. & Tel. as a telephone company **8-67**
Field phones, British & Japanese *8-20*
Fullerphone and Sutel *8-23*
Needle and dial telegraphs *3-100*
Power buzzer *8-20*
Tel. & Tel. system, France, WW I **6-138**

TRANSMITTERS AND TRANSCEIVERS

General

Alexanderson alternator 3-120
Army, BC-SCR-RC directory 6-49
Army-Navy equipment-maker code (CA thru CEFR) 7-69
Navy electronics directory 8-123

Spark/ARC

Chambers spark set (pic) 2-124
De Forest arc radiophone (pic) 1-12
Federal arc **7-119, 8-75**
German WW I (pix) 6-140, 8-15
Kilbourne & Clark 2-kW arc and spark (pix) .. 7-118
Marconi
Development at Poldhu **7-29**
P-2 ..... **1-35**
SCR-54 (pix) 1-53
SCR-65 (pic) 1-56
SE-1205 (Wireless Specialty Apparatus) 1-59

Tube — U.S.

Air-Sea Rescue (SCR-578) 8-10
AN/PPN-2 paratroop beacon 8-9
ATB (pic) 8-122
Broadcast, GE, '20s **7-159**
CN-3311 (pic) 8-116
GE AT-702 (pic) *5-11*
GF-12 (pic) 8-129
Hammarlund line *2-103*
SCR-284 (pic) *6-50*
SE 1380 aircraft (pic) 4-2
RT-6 8-10
TCZ (pic) 8-142
W. E. 1A (pic) *3-50*
W. E. 101A (pic) 2-130
WJZ Bound Brook (pic) 3-56

Tube — Foreign

Agents' Sets
British, German, Soviet **8-1**
Italian suitcase set (pic) 5-98
German suitcase set (pix) 5-100, 5-102
German SE99/10 8-4
Air-Sea Rescue (German NG2, British Type 33) 8-10
GRANIT (Soviet) 8-10
LWAW radar (Australian) 7-67
SEG15D (German) 8-29
TR3174 paratroop beacon (British) 8-9
Wireless Sets Nos. 18, 19, 21, 29, 46, 62, 66; Mk 51/1, Mk 121, Mk 122, Mk 123, Mk 128, Mk 217; A16, A Mk III, C Mk I, 120 Watt Mk I, Type 3 Mk 2, RS 109A (British) *8-9*

TUBES

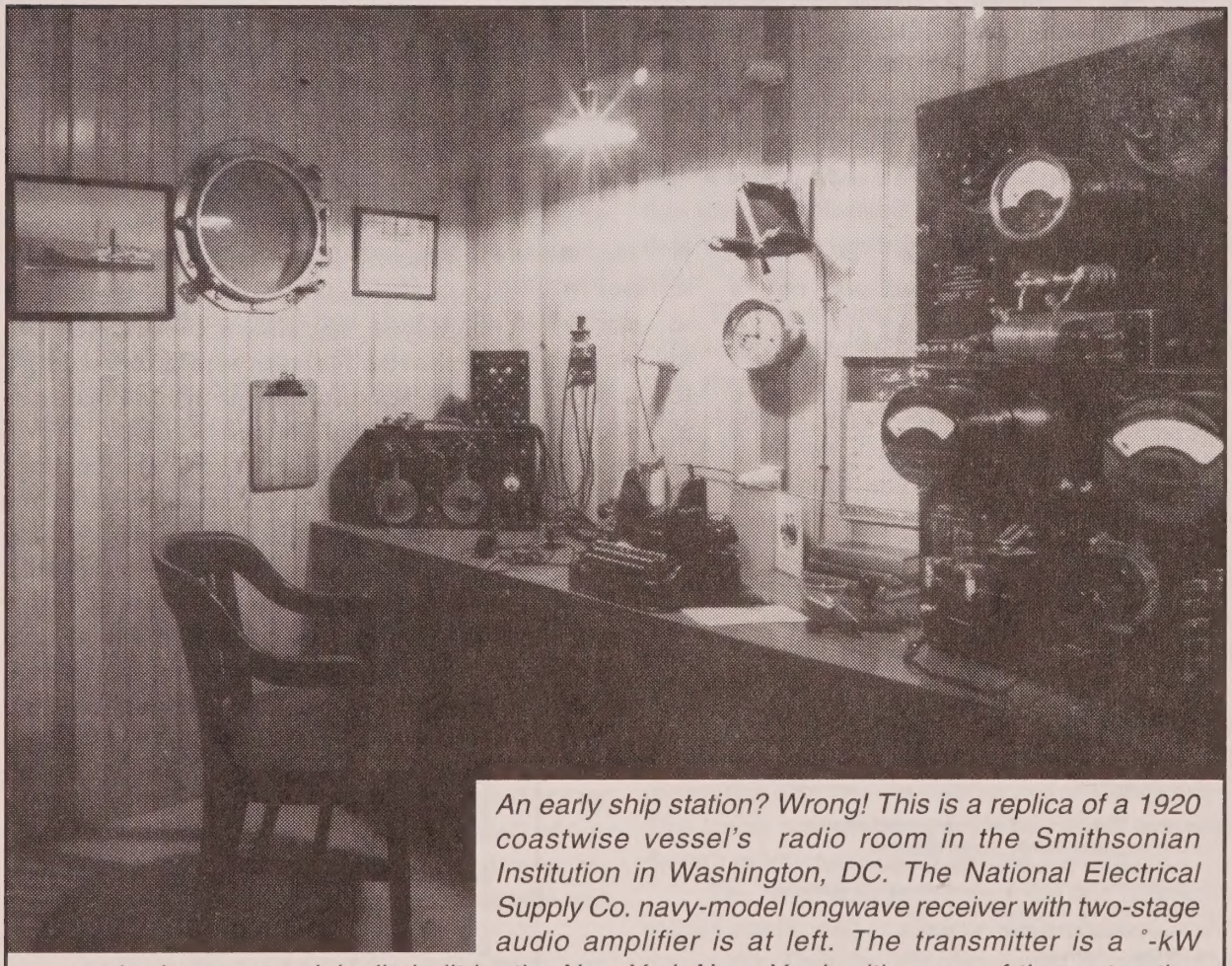
General

Australian types
Early **6-125**
WW II types *7-66*
Eaton Collection, WW I (pics of 41 types + description) **6-2, 7-107**
Fetsch Collection (w/pix) **8-110**
Navy WW I types (CW-186, CF-340, CG-880, CW-931, CW-933, CG-1162, SE-1444) **6-10**
"Rare, and Why They're Rare" **8-47**

By Maker/Type

AWA Australian types **6-125**
Collins C-100 ..... *7-152*
De Forest
Audions, "bootleg" *8-50*
Oscillion 6-16
(pic of 5) 8-110
CF-122, CF-185, CF-187 7-112

Expanse B **6-125**
General Electric
Type G, P, and T Pliotrons *4-22*
VT- & CG-types, chart *4-27*
G & R (Australian) 6-131
H & K Gammatrons 55, 155, 255 ..... **7-156**
LRS Relay **5-45,** *8-46*
Marconi Type D *8-49*
Philips, Australian types **6-125**
RCA Radiotron line, 1921-30 ..... **5-4**
Metal, development of *7-21*
Round Valves (C, N, CA, LT, TFHC3F, FE1, ERECT) *8-51*
STC, Australian types **6-125**
UV-196 ..... *3-49*
UV-207 (pic) *5-15*
UV-213 3-68
UV-216 3-69
UV-859 (pic) 7-171
UV-862
Development *5-14*
As linear amp **8-149**
Early (pic) *8-i*
VT-90 (WE 710A) **7-66**
Western Electric (Northern Electric)
Commercial equivalents, table 4-113
Date codes *5-118*
Foreign-made equivalents, table *5-114*
Identifying and dating **5-109**
"Interesting and historic types" **4-110**
Klystrons, table *4-124*
Magnetrons **7-47**
Table *4-127*
Manufacturing process **4-45**
Triodes, "A" to 300A, table *4-50*
300B **4-45**
7xx-series radar types **7-47**
VT- and CW-types *5-112*



An early ship station? Wrong! This is a replica of a 1920 coastwise vessel's radio room in the Smithsonian Institution in Washington, DC. The National Electrical Supply Co. navy-model longwave receiver with two-stage audio amplifier is at left. The transmitter is a °-kW quenched-gap set, originally built by the New York Navy Yard, with many of the restoration components supplied by the AWA Museum. Note the contemporary Oliver see-through typewriter.

THE COMMUNICATION RECEIVER

EDITED BY
William Fizette, K3ZJW
RD 1, Box 55, Henryville, PA 18332
All correspondence requires SASE for reply.

THE BRETING 14 COMMUNICATIONS RECEIVER

By Lawrence L. Rosine, W0OG
13719 Alhambra, Leawood, KS 66224

INTRODUCTION

At one time or another anyone who has attempted to restore to working condition one of the vintage communications receivers has run into a problem that seem unsolvable. Not infrequently, it boils down to the fact that we are working with erroneous information, no matter how official the source. Further, many of the circuits in use in the 1930s were nonstandard because manufacturers introduced variations in an attempt to outdo the competition. In this story, one of the authorities on early communications receivers describes just such an event. The receiver, the Breting 14, is one of the little known products of the Breting Radio Mfg. Co. of Lost Angeles, CA. The Riders reference is 8-1-2. —Ed.

The Breting 14 reminds you of a pretty girl in a gunny sack dress. The chrome-plated chassis and combination mirror/drum tuning dial are something to behold, and the cabinet is one of the most hideous structures I have ever seen on a communications receiver. And the lack of marking on the panel is frustrating. (Not uncommon on 1930s receivers, as witness the HRO and the RME-69, to name just two. —Ed.)

The set does not use a Lamb-type noise silencer, push/pull audio, at least one state of RF on all bands, and two stages of IF. However, it appears that these receivers were not mass produced, as they differ slightly in mechanical construction. On some of the 14s holes were factory redrilled on the beautiful chrome plate so that components would fit properly.

Many of these sets are out of commission and cannot be repaired because the schematic printed in both Volume B of Riders and the operator's manual contain errors. If wired as shown, these receivers will never work properly, and I can say positively that this is a difficult receiver to restore without proper background information. Having access to four of these, and having repaired others, I was able to piece together the quirks introduced by Breting.

The following notes will give you an idea of the problems encountered.

V1, the first RF amplifier stage, is used only on band 4. The bandswitch normally connects the antenna directly to the primary of coils 1, 2, 3, and 5 feeding V2, the 2nd RF stage. On band 4, the switch grounds the primary of the coil in the grid of V1,

Breting 14 Voltage Readings

		Pin #							
	GRI	#1	#2	#3	#4	#5	#6	#7	#8
V1 6K7 RF AMP	0		6AC	275	110	4	NC	6AC	4
V2 6K7 RF AMP	-0.3		0	275	110	4	NC	6AC	4
V3 6J7 MIXER	0	0	0	275	100	6	NC	6AC	4
V4 6J7 OSC	-20	0	6AC	250	100	0	NC	0	0
V5 6K7 IF-AMP	-0.3	0	0	270	110	4	NC	6AC	4
V6 6L7 IF-AMP	-0.3	0	6AC	280	55	-0.4	NC	0	2
V7 6B8 DET-AMP		0	0	200	-3	-3	70	6AC	0
V8 6K7 ANL-AMP *		0	6AC	280	55	6	NC	0	6
V9 6H6 ANL *		0	0	-0.4	0	-0.4	NC	6AC	0
V10 6J7 S MTR **		0	6AC	270	150	2	NC	0	2
V10 6J7 BFO **		0	6AC	270	160	6	BC	0	6
V11 6F6 AUDIO		0	0	270	270	-23	NC	6AC	0
V12 6F6 AUDIO		0	0	352	352	-42	NC	6AC	0
V13 6F6 OUT		0	0	352	352	-42	NC	6AC	0
V14 5Z3 RECT		352	AC	AC	352				

* --> Noise Silencer: Switched on and control at zero.
--> Communication Switch: Turned clockwise.
--> Audio Volume Control: Turned counter-clockwise.
--> Crystal Phasing Switch: Turned off, counter-clockwise.
--> Band Selector: Broadcast band, high end.
--> Tone Control AC Switch: Clockwise.
--> RF Gain: Clockwise.
** --> BFO Switch: Off for S meter readings, on for BFO readings.
--> BFO Tone: Not applicable.
--> Note: Those marked ìno connectionî (NC) may be used as soldering tie points and may show a reading but should be ignored.
--> Pins 3 and 4 of the 5Z3 measure 350 volts AC to ground.

thus placing that stage into use. Apparently any loss in the primary of this coil (LX) was considered negligible by the designers when it is in series with the primaries of L1, L2, L3, and L5. This design could be detrimental to band 5 operation.

In some receivers the cathodes of V1 and V2 are tied together. In others, the cathode of V1 is grounded. While it was common practice for amateurs to modify their receivers, in these particular sets the wiring appears to be original, from the manufacturer.

Not shown on the original schematic is a switch on the noise limiter control that turns on the heaters of V8 and V9 when the limiter is used. Thus it takes a few seconds for these tubes to warm up and the limiter to operate.

V10, the 6J7 BFO, serves as a meter amplifier (a cathode follower) when the BFO is off. This amplifies the AVC signal and applies it to the S-meter. This is also missing from the original schematic, leaving one to wonder if Breting didn't want its competitors to know this design trick.

The correct circuit, shown in Fig. 2, uses a 5000 ohm resistor connected in series with the bottom of V10's 100K ohm grid resistor. The junction of these two resistors connects to the AVC line, and the other end of the 5K resistor to the 0.01 mF capacitor at the bottom of the V10 grid coil. The BFO switch shorts this connection to ground, turning on the BFO. The current through the S-meter drops and it goes to the zero position (tricky).

While not shown, the bottom of the audio gain control is grounded.

The trimmers on the RF, mixer, and oscillator stages are in different physical locations on some receivers. You will have to experiment to determine your particular receiver's trimmer positions when aligning the set.

I have seen three different factory-installed vernier drives on the main tuning control, while one set had no vernier drive at all.

On most of the Breting 14s, the BFO tuning capacitor is mounted vertically and the shaft protrudes down through the bottom plate. The manufacturer suggests soldering a piece of wire to the shaft of this control to adjust it manually. However, on some receivers the BFO capacitor is mounted normally and is controlled with a knob.

Additionally, on some of the sets the BFO "on" switch is mounted vertically like the BFO control and is switched with a lever protruding under the chassis.

Breting 14 Resistance Readings

		Pin #							
	GRI	#1	#2	#3	#4	#5	#6	#7	#8
V1 6K7 RF AMP *	0	0	0.8	50K	30K	200	NC	0	200
V2 6K7 RF AMP	6K	0	0	50K	30K	200	NC	0.8	
V3 6J7 MIXER	4	0	0	50K	1M	5K	NC	0.8	5K
V4 6J7 OSC	30K	0	0.8	50K	140K	0	NC	0	0
V5 6K7 IF-AMP	260K	0	0	50K	30K	400	NC	0.8	390
V6 6L7 IF-AMP	6k	0	0	50K	160K	125K	NC	0.8	300
V7 6B8 DET-AMP	1.5M	0	0	300K	245K	245K	2M	0.8	0
V8 6K7 ANL-AMP	6K	0	0.8	50K	160K	16K	NC	0	28K
V9 6H6 ANL		0	0	120K	0	120K	NC	0.8	0
V10 6J7 BFO	100K	0	0	50K	150K	500	NC	0.8	0
V11 6F6 AUDIO		0	0	50K	50K	560K	NC	0.8	0
V12 6F6 AUDIO		0	0	50K	50K	550	NC	0.8	0
V13 6F6 OUT		0	0	50K	50K	550	NC	0.8	0
V14 5Z3 RECT		50K	505	505	50K				

Resistance readings taken with the following front panel controls settings:
--> Noise Silencer: Switch on and control at zero.
--> Communication Switch: Turned clockwise.
--> Audio Volume Control: Turned counter-clockwise.
--> Crystal Phasing Switch: Turned off, counter-clockwise.
--> Band selector: Broadcast band.
--> Tone Control AC Switch: Clockwise.
--> RF Gain: Clockwise.
--> BFO Switch: On.
--> BFO Note: Not applicable.
Note: Those marked ìno connectionî (NC) may be used as soldering tie points and may show a reading, but should be ignored.
* Some receivers have the cathode of V1 connected to ground, while others have this cathode tied to the cathode of V2.

You may find that different versions of the Breting 14 have different front panel layouts. Evidently this was not perceived as a problem since Breting didn't believe in lettering the control functions on the panel.

The main tuning capacitor has two sections for each stage. On the BC band both sections are used to tune the stages. The capacitor is mounted on very long standoffs, which leads to mechanical instability. The oscillator stage is at the back, away from the tuning mechanism, an example of poor design practice. The combination of the play introduced by the long mechanical distances, the standoffs, and poor vernier drives leads to tuning backlash. Of the four examples I had to work with, the best operating set in this respect had no vernier drive, while the second best used a belt drive vernier.

Breting scrimped on solder tie points by using inactive tube socket terminals as ties and also by just connecting components together and soldering them. This leaves parts hanging in midair which certainly doesn't enhance the under-chassis appearance.

The manufacturer suggests that this set's audio section can be used as a driver or a modulator for the transmitter. Thus the 200 ohm output is switched in by the communications switch. To use it as a modu-

lator, another 200 ohm to high impedance transformer is connected to the existing one.

RESTORATION COMMENTS

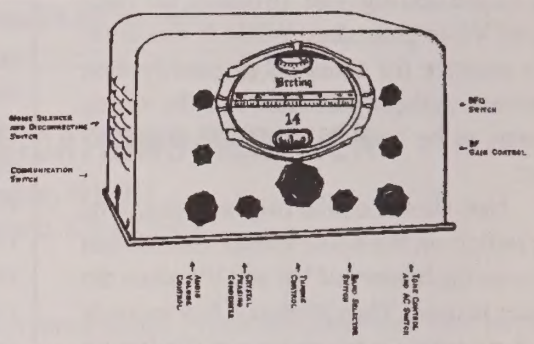
Do not remove the dial drive cords unless absolutely necessary. Considerable time and frustration are involved in restringing them.

The gimmick between the two IF coils may be changed to affect the bandpass coupling. The IF frequency is 432 kc. (Note: This will vary with the frequency of the IF crystal, and when aligning the set, it is necessary to peak the IF on this crystal frequency. —Ed.)

The decrease current drain on the transformer, 6K6s may be used in place of the original 6F6 audio tubes.

Tables 1 and 2 list the average voltage and resistance measurements taken from three properly operating receivers. The V1-V14 tube designations were assigned by the writer: they are not listed on the manufacturer's diagram.

In closing, the Breting 14 is a fairly hot receiver when it is operating properly. If you undertake a restoration project, good luck. I will attempt to answer any inquiries accompanied by an SASE.



A pen and ink drawing of a Breting 14.

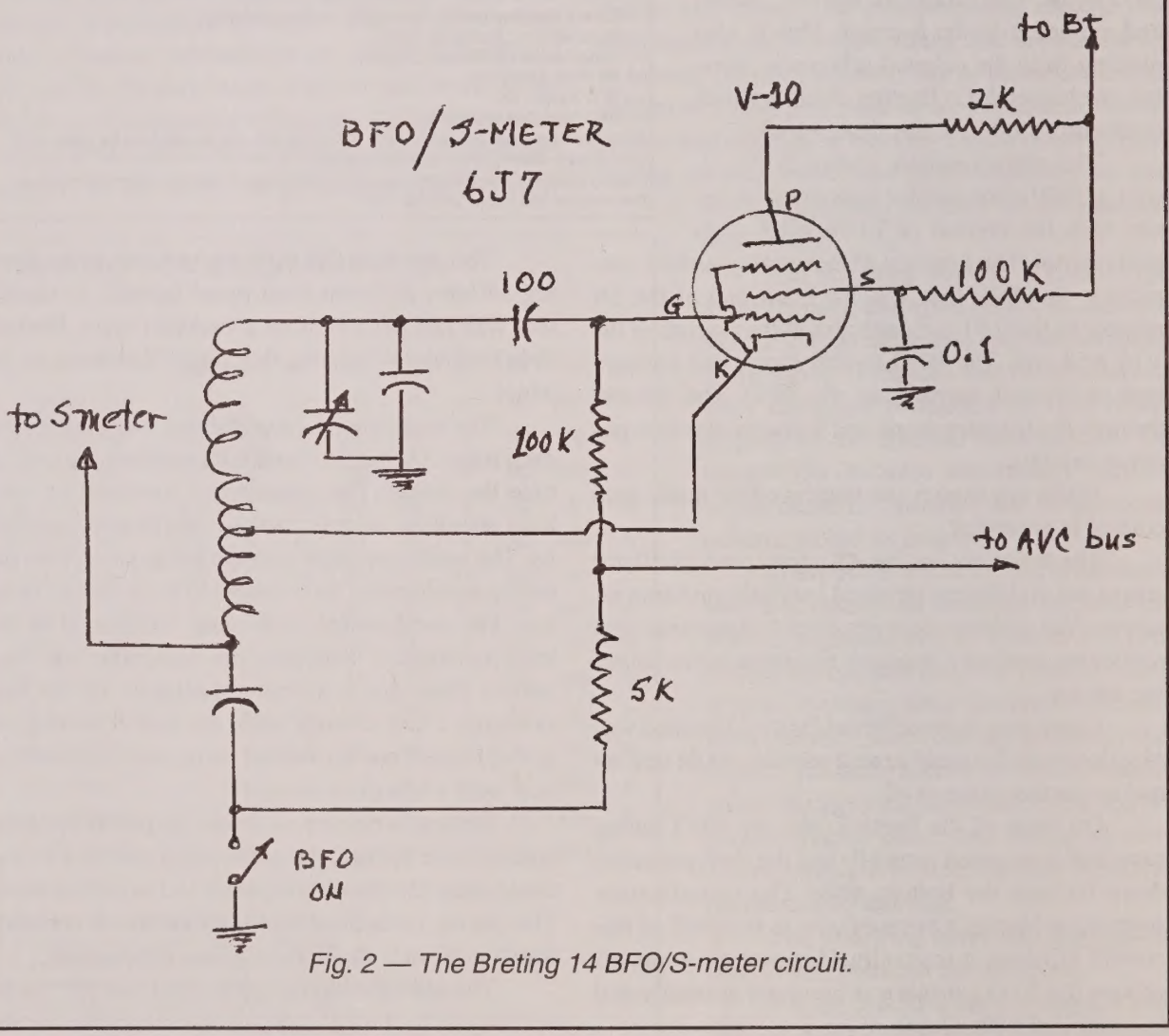
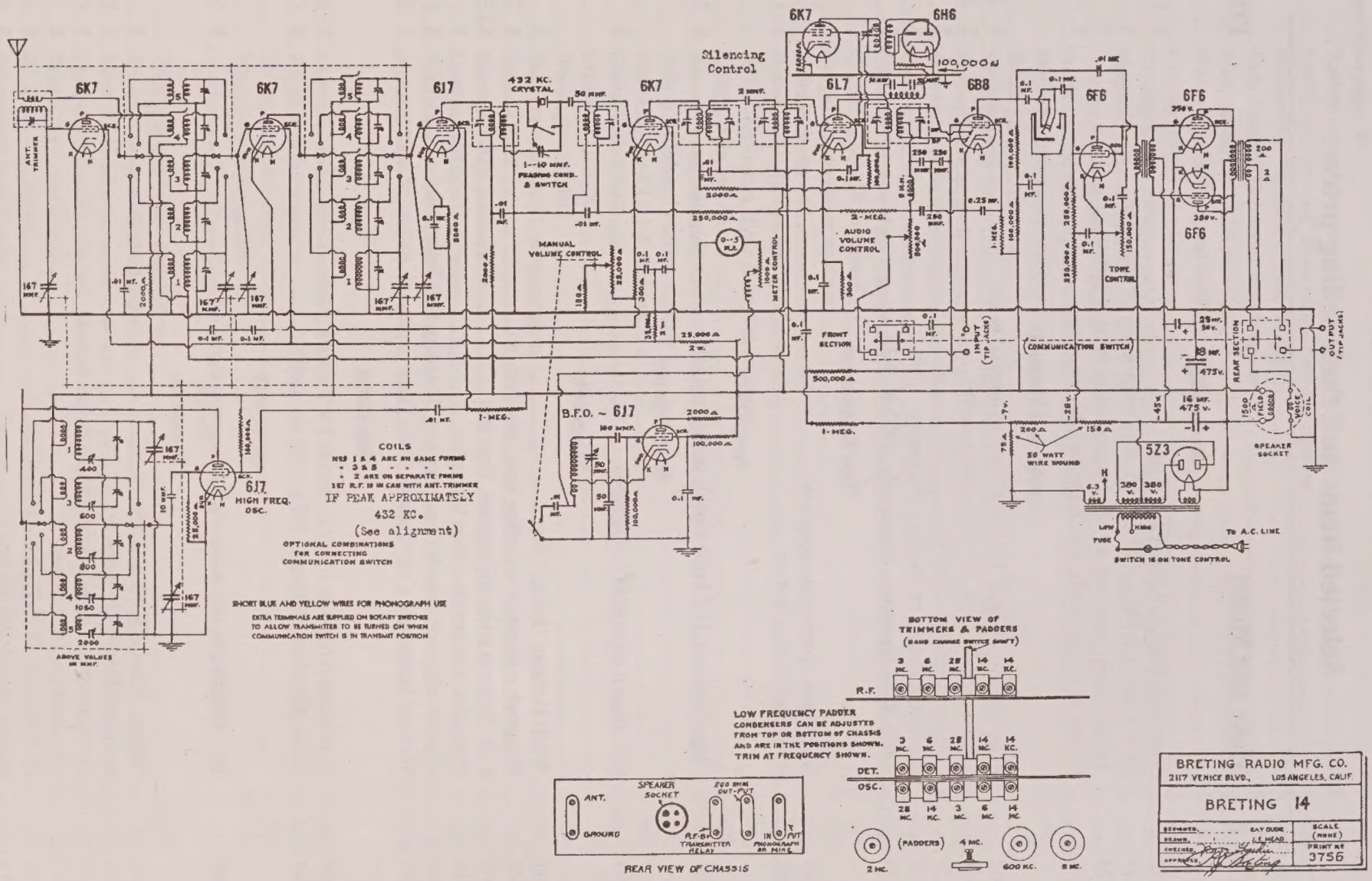


Fig. 2 — The Breting 14 BFO/S-meter circuit.

BRETING RADIO MFG. CO



REAR VIEW OF CHASSIS

LOW FREQUENCY PADDER CONDENSERS CAN BE ADJUSTED FROM TOP OR BOTTOM OF CHASSIS AND ARE IN THE POSITIONS SHOWN. TRIM AT FREQUENCY SHOWN.

BRETING RADIO MFG. CO.
2117 VENICE BLVD., LOS ANGELES, CALIF.

BRETING 14

DESIGNED	RAY DUDE	SCALE (NONE)
DRAWN	L.E. MEAD	
CHECKED		PRINT NO 3756
APPROVED		

AWA Auction '94

Selected items and their selling price

Tkt. #	Make and Model	Price
	Advertising	
992	Stromburg Carlson Advertising Sign	$ 130
847	RCA Television Plaque, 61 of 100, 50th anniversary of television	$ 75
970	Atwater Kent, complete set of 12 radio artists, mint condition	$ 55
956	Picture of Cyrus Fields, which includes his autograph	$ 75
	Books and Manuals	
002	*Rider's Radio Manual,* Volumes I to V in original boxes	$ 210
961	Federal receiver book for orthosonic receiver	$ 220
725	Chicago Apparatus Catalog	$ 60
729	Maxwell's *Theory of Wireless Telegraphy* - 1904	$ 60
829	*AARL Radio Amateur's Handbooks,* 1933 & 1938	$ 52.50
	Test Equipment	
889	Wimshurst electrostatic generator	$ 250
896	Northern Electric, test set	$ 110
	Amplifiers	
802	Clapp-Eastham, H Z knife switch model amplifier	$ 260
	Head Phones	
007	S.G. Brown adjustable headphones	$ 70
	Telegraphy	
941	WWII German "Junker" key	$ 65
144	Telegraph equipment including keys, sounders, etc.	$ 725
168	L.M. Erricson telegraph register, Type 800	$2,300
110	Vibroplex, Presentation Blue Vibroplex	$ 90
766	Bunnell telegraph sounder, base marked "Made by Bell Telephone"	$ 375
795	Marconi Instrument Code Course, Code Tutor	$ 200
	Magazines	
998	*Gernsback Television 1 and 2*, British TV, 7 issues	$ 100
783	*Radio Retailing,* 19 issues, 1932-1938 assorted	$ 110
	ODO/MIL	
784	Toy Western Electric deluxe radio-telegraph signal set	$ 100
	Receivers	
747	Federal, Federal A-10 receiver	$ 65
986	Kennedy, Model 525 receiver	$ 575
760	Metco Electric Co., Metrodyne Super Seven receiver	$ 150
993	RCA Radiola III receiver	$ 75
996	RCA Radiola III and balanced amplifier	$ 240
013	Federal Model 110 receiver	$ 425
018	Bowmah Airophone one-tube receiver	$ 110

Continued on Page 31

. . . AWA Auction continued

Continued from page 30

019	Radion crystal receiver	$ 100
843	Mel Comer Special, loose coupler crystal receiver	$ 450
022	GEcophone Model 2 crystal receiver	$ 250
049	Fada Model 252 butterscotch receiver	$ 175
894	Marconi Model V-2A receiver	$1,400
903	Radio amateur's crystal receiver, 1926	$ 460
054	Crosley Model 52 receiver	$ 425
061	Crosley Model 50 receiver	$ 430
062	Majestic Joliette receiver	$ 200
074	Atwater Kent Model 84 receiver	$ 380
822	Arvin — two Arvin (plastic salmon), FADA (caralin)	$ 400
827	DeForest Interpanel receiver	$1,300
103	Radio glow receiver	$2,300
881	RCA Radiola IV	$ 275
952	Beaver Electric, early cathedral receiver	$ 575
123	Johnson and Phillips Mark III, No. 4949 WWI crystal receiver	$1,650
883	Detrola, AC clock radio receiver	$ 220
902	Canadian Independent Telephone Co., Everyman Radiophone crystal receiver	$ 350
954	Grebe Model CR5 receiver	$ 525
163	Grebe Syncrophaser receiver	$ 200
825	Federal model 140 receiver	$ 310
924	DeForest Model DT-600 crystal receiver	$ 500
171	AEG-Telefunken, Type D crystal receiver	$ 340
797	Crosley Pup, in box	$ 600
016	Atwater kent, cathedral AM with three shortwave bands	$ 220
778	Britman-Maker, London, receiver	$1,550
948	DeForest Model RJ-4 receiver	$ 400
780	Grebe Type CR12	$ 600
772	Crosley Model XJ	$ 70
745	Westinghouse, RC	$ 180
744	Hallicrafters SX 62, with speaker	$ 150
739	Grebe CR12	$ 380
750	German EP2A receiver	$ 400
751	German 124/106C receiver	$ 375
950	"Miracle," Uncle Al's crystal receiver	$ 230
759	Atwater Kent Model 46 receiver	$ 210

Speakers

056	Marconi Model M-5 speaker	$ 240
803	Amplion AR-19 speaker	$ 170
055	Farrand speaker cone, senior	$ 120
015	Magnavox horn speaker	$ 120

Tubes

008	Westinghouse triode demonstrator	$ 200
909	Weagant valve with good filament	$ 220
905	Kodel C-11 tube	$ 300
824	Ladd Co., Giessler tube set	$1,550
039	Wunderlich, two tubes	$ 80
972	RCA WD-11, tested	$ 60
907	Moorehead Type B tube	$ 170
034	Schickerling, two S-70 tubes	$ 75

Continued on page 32

. . . AWA Auction continued

Continued from page 31

071	Moorehead, four tubes: Type A, Type VT, and two ER variants	$ 100
000	Huth LE-244 German tube	$ 40
978	Welsh peanur tube with box and instruction sheet	$ 10
919	Giesler tube, blue with yellow	$ 90
906	Western Electric "P" tube	$ 160
914	Osram R5 tube	$ 180
915	Arcotron, German external control tube	$ 110
949	DeForest Audion single-wing tube	$ 900
910	Westinghouse 201 tube	$ 160
976	Welsh peanut tube with box and instruction sheet	$ 11
030	QRS red top, UV, red base, good filament	$ 32.50
987	DeForest "H" tube	$ 90
999	Myer Tublar with original box and packing	$ 25
068	Vac-O-Bub detector tube, open filament	$ 25
080	RCA experimental Type A 240L, high gain tube	$ 100
154	Eimac VT158 tube	$ 160
904	Loewe 3NF tube	$ 110
799	Western Electric VT-2	$ 80
908	Western Electric 201A tube	110
916	Marconi Osran Valve LS2 tube	$ 110
031	Western Electric 216-A tube	$ 110
037	Schickerling, three S-4000 tubes, two to a box	$ 85
042	QRS, one tube	$ 55
779	Crooke's Railway Tube, c. 1910	$ 450
001	Baird Type TV neon tube	$ 110
817	RCA photo tubes, two 5826 tubes	$ 170
070	DeForest, four tubes: DV-5, DV-7, DV-14, DL4	$ 140
913	General Electric "U" tube	$ 85
921	German WWI horizontal mount triode with socket	$ 150
033	Kellogg, four 401 tubes	$ 25

Microphones

075	RCA DX-77 microphone	$1,050
076	RCA DX-77 microphone	$1,300

Transmitters

892	World War I spark transmitter, Model SCR-65	$ 270

AWA AWARD CRITERIA

Awards follow these criteria: **Tyne Tube** — honoring Gerald Tyne, for contributions to preserving or documenting the history of tube technology; **Elle Craftsman** — in memory of Bruce Elle, to a builder of high-quality communications equipment of old and new type; **Thompson Best of Show** — in honor of early amateur Eunice Thompson, W1MPP, for an entry in the equipment contest at the Annual Conference; **Cundall Old-Time Contest** — in memory of Lincoln Cundall, W2LC, to the winner of the AWA old-time CW contest; **AWA Houck - Documentation** and **AWA Houck - Preservation** — to remember Harry Houck, radio developer, for achievement in documenting radio development/history or in collecting/documenting radio artifacts respectively; **Matlack** — via support of Rex Matlack, W3CFC, for excellence in constructing or restoring amateur equipment; **Taylor** — in memory of John Taylor, RCA television developer, for preserving TV history; **Display** — for quality and informational value in an exhibit at the equipment contest at the Annual Conference; **President's** — chosen by AWA's president, for outstanding service to the Association; **BK-OTB** — via support of Bruce Kelley, for the outstanding original *OTB* historical article of the award year.

A-W-A-RDS AND THEIR WINNERS

YEAR	TYNE TUBE	ELLE CRAFTSMAN	THOMPSON	TAYLOR
1980	Bro. Patrick Dowd	Alan Douglas		
1981	John Stokes	Robert MacIntyre		
1982	Lauren Peckham	Lincoln Cundall		
1983	William Condon	—	Ralph Muchow	
1984	—	Mike Katzdorn	Jim & Felicia Kreuzer	
1985	—	Ross Smith	Lauren Peckham	Ken McIntosh
1986	Alan Douglas	A.C. Stoddard	Alan Douglas	Richard Brewster
1987	Rüdiger Walz	—	Jim & Felicia Kreuzer	Edmund Taylor
1988	Bill Orr	Robert Murray	Michael Payne	Stephen Hofer
1989	—	Billy Richardson	Floyd Jury	Peter Yanczer
1990	Gertrude Tyne	Lauren Peckham	Mike Katzdorn	Arnold Chase
1991	John Anderson	—	Jim McKinnon	Pat Leggatt
1992	—	Gordon Symonds	George Freeman	David Johnson
1993	Edward Herold	—	Stephen Brown	—
1994	Albert Jones	—	Bill & Fran Holly	John Okolowicz

	CUNDALL OT CONTEST	AWA HOUCK - DOCUMENTATION	AWA HOUCK - PRESERVATION	MATLACK
1971	W2LV	Thorn Mayes		
1972	W2LV	Bruce Kelley	Ed Raser	
1973	W2LV	Gerald Tyne	Robert Merriam	
1974	W2LV/W0TRF	Lou Moreau	Warren Green	
1975	W1DM	William Breniman	Stuart Davis	
1976	W1DM	Howard Schrader	Wayne Nelson	
1977	W1DM	Ralph Williams	Vance Phillips	
1978	K4TS	Don deNeuf	Lauren Peckham	
1979	W1DM	Ivan Coggeshall	Joseph Pavck	
1980	W2LV	Lloyd Espenschied	Ralph Muchow	William Shaw
1981	K4TS	Alan Douglas	John Caperton	—
1982	K4TS	—	Fred Hammond	John Haught
1983	W2LV	Kaye Weedon	Patrick Dowd	Bill Hurni
1984	K4TS	Floyd Paul	Rex Matlack	A.C. Stoddard
1985	K4TS	Hugh Aitken	Ralph Williams	—
1986	W8VSK	Bill Fizette	—	James Miller
1987	W2BJI	John Nagle	—	John Rollins
1988	W1YG	Don Patterson	Robert Lozier	John Rollins/ Marshall Etter
1989	W2VDI	Bob Morris	Bruce kelley	Neil Wiegand
1990	W2ER	Morgan McMahon	Charles Dachis	Bob Mattson
1991	W2ER	John Anderson	Bob Paquette	John Rollins/ Parker Heinemann
1992	W1YG	Tom Lewis	Al Jones	Mike Raide
1993	W2ZM	Bill Holly	Mike Feher	Mike Raide
1994	W2ZM	Edwin Lyon	—	Edward White

	DISPLAY	PRESIDENTS	BK-OTB
1986	Franz Mock/ John Glisson	Arlene Roloson	
1987	Max de Henseler	Bruce Kelley	
1988	Bill Fizette	Sherwood Snyder	
1989	Robert Lozier	Helen Kelley	
1990	Jerry & Marsha Simkin	Richard Neidich	Jack Kingman
1991	Floyd Jury	Dexter Deeley	Lloyd Espenschied
1992	Robert Murray/ Robert MacIntyre	Bill Fizette	Robert Murray
1993	Floyd Jury	Ludwell Sibley	Peter Yanczer
1994	Bill Holly	Edward Gable	John Okolowicz

AWA CONFERENCE '94

OLD EQUIPMENT CONTEST WINNERS

THE MORSE TELEGRAPH CATEGORIES

1. Earl;y Wire Telegraph Equipment

Category A: Related Devices

FIRST: James Kreuzer & Peter DeAngelo — Telegraph Test Galvanometers
SECOND: Ron McClellan — Philips-Morse Auto Telegraph
THIRD: Bob McGraw — Bridge Duplex Telegraph

Category B: Keys

FIRST: Geoffrey Bourne — Single Needle Telegraph
SECOND: Dr. Ed Taylor — Foote-Pierson Field Instr.
THIRD: Neil Friedman — British Portable TV Set
Special: Bengt Svenson — L.M. Ericsson 1875 Key, Mention

2. Early Telegraph Documentation

FIRST: Bill Holly — Tel. & Atlantic Cable History
SECOND: Jerry & Marsha Simkin — Tel. Books & Ephemera
THIRD: Elinor Williams — Books, Vail and Reid
Special: Neil Friedman — 1861 European Tel. Text, Mention

THE WORLD WAR II CATEGORIES

3. The Soldier' Radio

FIRST: Marty Reynolds — Allied "Morale" (Hallicrafters)
SECOND: Larry Weeks — German "Morale" (Luftwaffe)

4. The Radio That Stayed Home

FIRST: Larry Babcock — Motorola Auto Set in Cabinet
SECOND: Ken Lowther — Zenith 6B129
THIRD: Dick Maciewicz — English Wartime Receiver

5. Military Radio Equipment

FIRST: Floyd Jury — Radar Display
SECOND: Ross Smith — Hallicrafters Receivers
SECOND: Will Jensby — M-209 Cipher Machine
THIRD: Marty Reynolds — Radio Direction Finder
Special: Bjorn Forsberg — Glider Radio & Wine Bottle, Mention

6. Document About Radio in WWII

FIRST: Chet Wisner — Naval Chronology (himself)
SECOND: Will Jensby — Intelligence Reports
THIRD: Marshall Etter — RCA Station Histories

7. Programs for Our Forces

FIRST: Larry Babcock — Churchill Speaks to Congress
SECOND: Ted Babcock — "Radio at War"

8. Foreign Wartime Radios

FIRST: Robert MacIntyre — R115A Aircraft Set 9. Tubes from WWII
FIRST: David Cheney — Admiralty Silica Tube
SECOND: John Parsons — Zahl Tube in Case
THIRD: Barney Wooters — Zahl Tube on Board

THE STANDARD CATEGORIES

10. Passive Receivers

FIRST: Jim Chew — Marconi Type 103

11. One- and Two-Tube Receivers

FIRST: Tom & Karen Pamula — Kennedy 110 & 525 Amplifier

12. Three-Tube Receivers

FIRST: Dr. Ed Taylor — Belcanto 1927 (European)
SECOND: Ross Smith — Pilot Short Wave Wasp

13. Four- and Five-Tube Receivers

FIRST: Robert Lozier — Phillips 2511, 1929
SECOND: Ron Frisbee — AK Model 5 with Early History
THIRD: Ray Thompson — Two AK Model 5s, Pamphlets

14. Six or More Tube Receivers

FIRST: Ernie Hite — Baldwin Superheterodyne
SECOND: John Parsons — Western Electric 4D
THIRD: Scott Guthrie — Higel Neutrodyne

15. Spark Transmitters

No Entries

16. Vacuum Tube Transmitters

FIRST: Edward White — 1 Meter Transmitter
SECOND: John Rollins — 1927 MOPA
THIRD: Harry Brown — 1929 TNT

THE CRAFTSMEN CATEGORIES

17. Restoration of Appearance

FIRST: Billy Richardson — Leutz Pliodyne
SECOND: Ken Lowther — Zenith "Walton" Set
THIRD: John de Loria — Ozarka Speaker

18. Restoration of Operation

FIRST: Jack Davis — Jenkins Radiovisor
SECOND: Billy Richardson — Rebuilt Battery Cells

19. New for Old

FIRST: Billy Richardson — World's Record Super
SECOND: Dave Moore — Stratosphere
THIRD: Ross Smith — DeForest PN with Audions

THE SPECIAL AWARDS FOR 1994

Transmitter Award

Bill Holly — Telegraph & Cable History

Display Award

Edward White — 1 Meter Tramsmitter

Best in Show

Bill & Fran Holly — Telegraph and Atlantic Cable

HISTORY DOCUMENTATION CONTEST JUDGES AND COORDINATORS

John Caperton
Ross Smith
Larry Chestnut
Geoffrey Bourne
Alan Douglas
Elinor Williams
Billy Richardson
Ralph Williams

The "New Andrews Sisters" brought back long-forgotten memories with their rendition of '40s-era songs.

Photos by Dick Ransley

Bill Holly's display on the history of the telegraph.

AWA 33RD ANNUAL CONFERENCE

By Bruce Roloson

This conference has been described by many who attended as one of the best ever. We had more than 900 in attendance, and the largest flea market with more than 280 sellers.

The programs were outstanding. Let me summarize them for you:

THE REAL STORY OF THE MAGNETRON by Ed Lyon was a very interesting account of the development of radar and the magnetron. Ed told of the contributions made by the United Kingdom, Japan, Germany and the United States. It was interesting as to the superior capabilities that the allies had during the war. Ed also presented some background on people who played key roles in the research and development of the tubes leading up to the split anode as well as the cavity type magnetrons.

THE HISTORY OF THE TELEGRAPH by Bill Holly was a complete history of early telegraph from the development of the Morse to the Trans-Atlantic Cable. Bill also gave insight as to how some of the people who influenced the telegraph's development from economic as well as technical points of view.

RADIO RESTORATION by Bob MacIntyre. Bob presented a slide show of the many ways to preform restoration of radios by refinishing, reproducing and duplicating parts. I think many of us found Bob's tips of great value. For example, he explained how he reproduced a grill by tracing the grill's outline from the old grill cloth with pins and a sheet of paper.

PRESERVING AN ORIGINAL MASEY WIRELESS STATION by Bob Merriam was an interesting presentation about the Masey Wireless Company, and the preservation of one the remaining stations still intact. The way that Bob told his story of demonstrated the great caring that he and Nancy have for the old Masey station.

ELECTRICAL APPARATUS DISPLAY hosted by Bruce Kelley and judged by Ray Hutt brought out some very rare equipment. In Group 1 Jim Kreuzer won first place with his Clark receiving unit. Ross Smith took 2nd with his Blake telephone transmitter. In Group 2 Peter D'Angelo won first place with a double induction motor. Second place went to Bill Holly with his early document dated 1758.

WW II MILITARY EQUIPMENT by Ludwell Sibley was very instructive in the various types of gear that was used by all services. It was interesting to see the changes that were made to basic set design over the course of the war. One could tell by Lud's presentation that he is well acquainted with the subject of military equipment.

RADIO IN WW II by Gary Yoggy was both entertaining and informative about radio broadcasting as well programs that were transcribed for use overseas. Gary also played some examples of how radio was used as propaganda.

The **BOOK FAIR** was a hit. The fair was open from Thursday to Saturday morning, and sales were very good, according to the vendors.

The **AUCTION** was very good as can be seen in the separate auction listing.

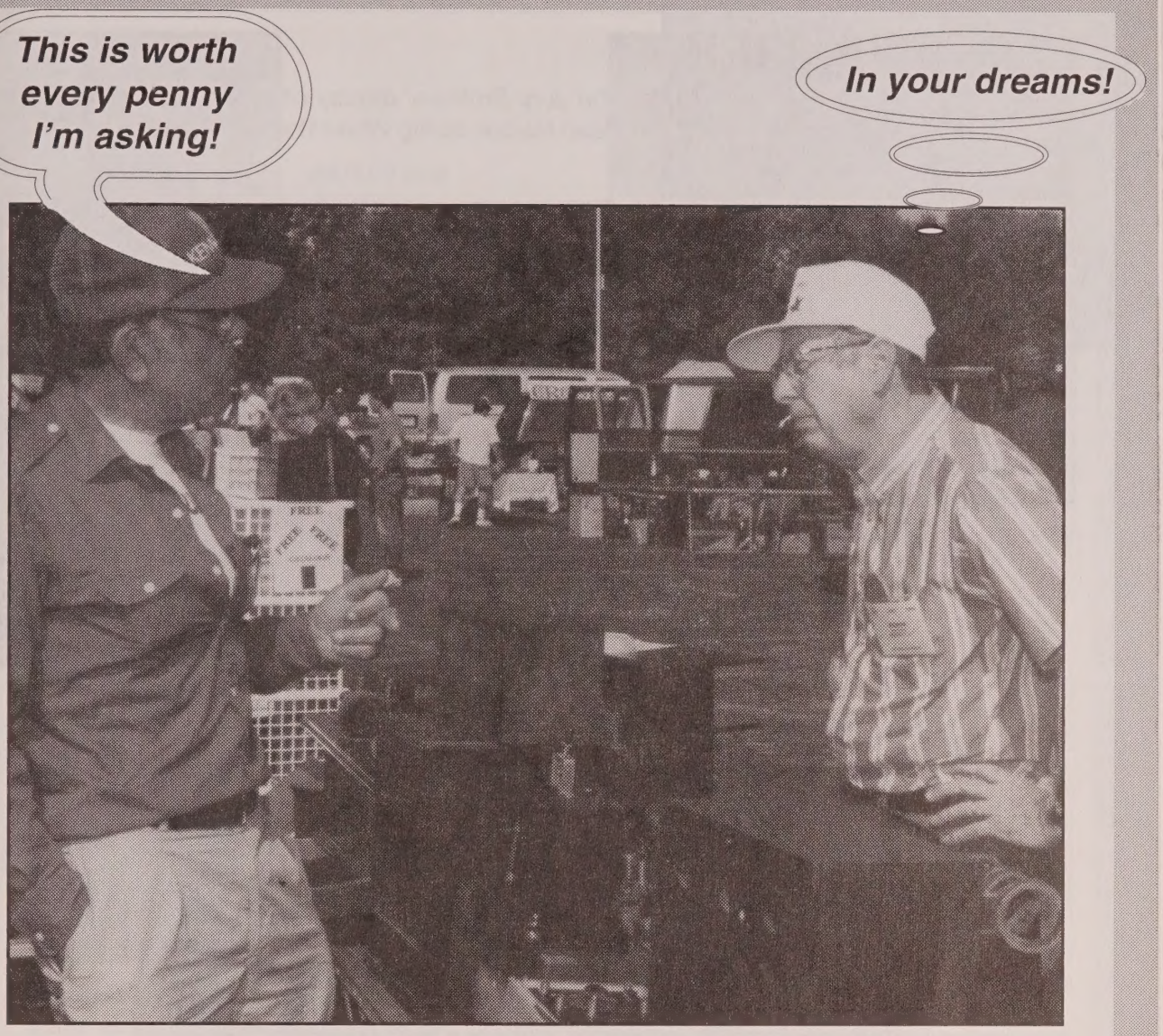
The **EQUIPMENT CONTEST** had some very impressive displays. The Jury brothers had one of the largest displays on radar that I have ever seen. Bill Holly's display on the history of the telegraph was excellent as shown by his winning the best display designation (see the separate contest listing).

The **FRIDAY NIGHT DINNER** had some great entertainment from the Bugle Boy Singers and Ed Clute on the piano. They preformed several old favorite songs from WW II.

The **SATURDAY NIGHT BANQUET** had Gary Yoggy presenting a program about Armed Forces Radio. The program was a star-filled re-edition of Dick Tracy. Bing Crosby was Dick Tracy, Dina Shore was Miss Trueheart and Bob Hope was Flattop.

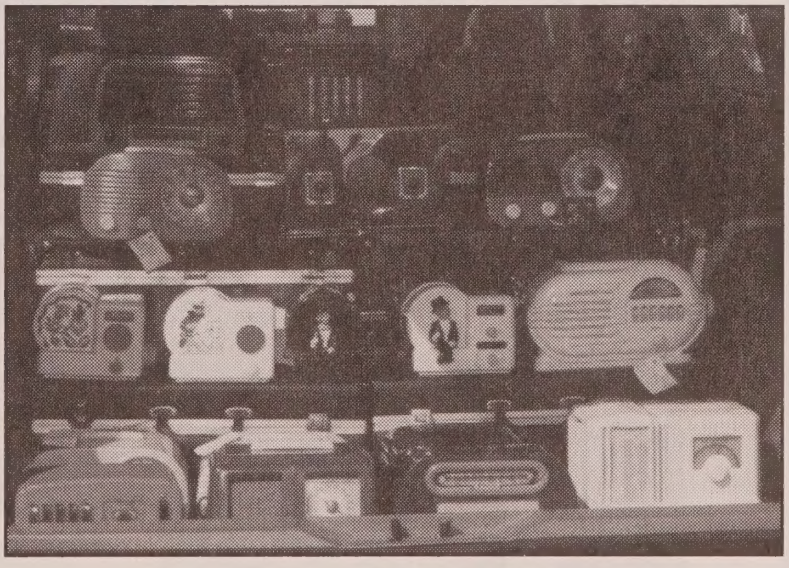
NOTICE — The 34TH AWA CONFERENCE WILL BE TWO WEEKS EARLIER THAN NORMAL, SEPTEMBER 6-9, 1995.

Box of tubes sold at auction during the annual conference.

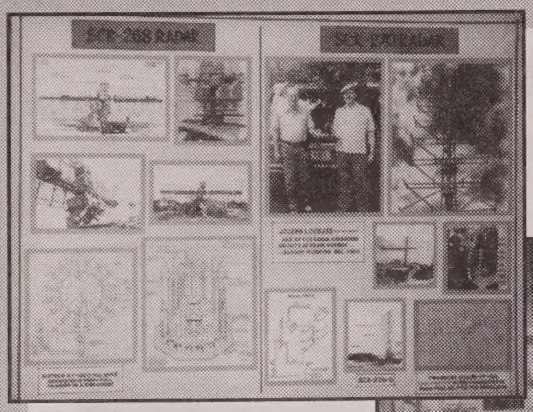


Haggling at the flea market.

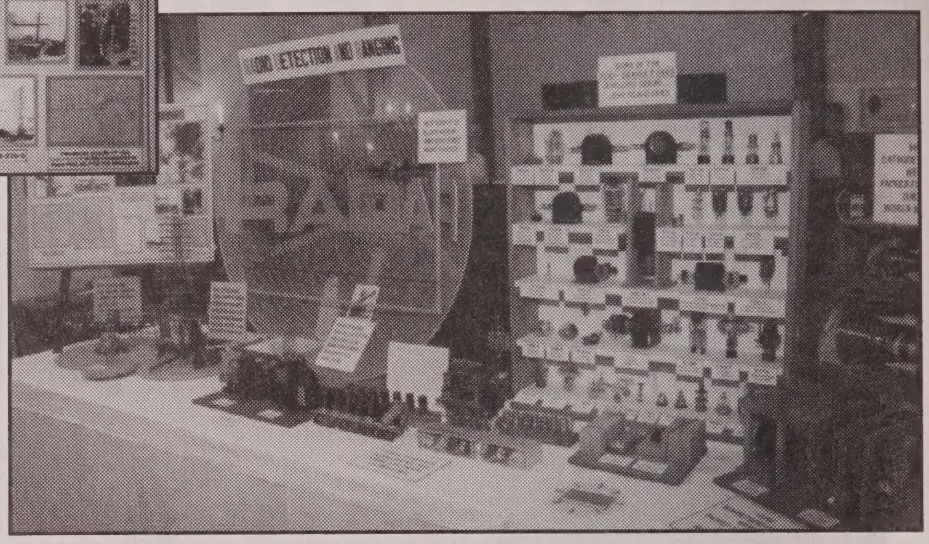
Photos by Bruce Roloson



There was a time when it seemed like every kitchen in America had one of these plastic cased beauties sitting on top of the refrigerator.

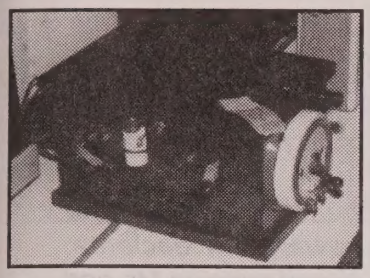


The Jury Brothers' display of radar as used at Pearl Harbor during World War II.

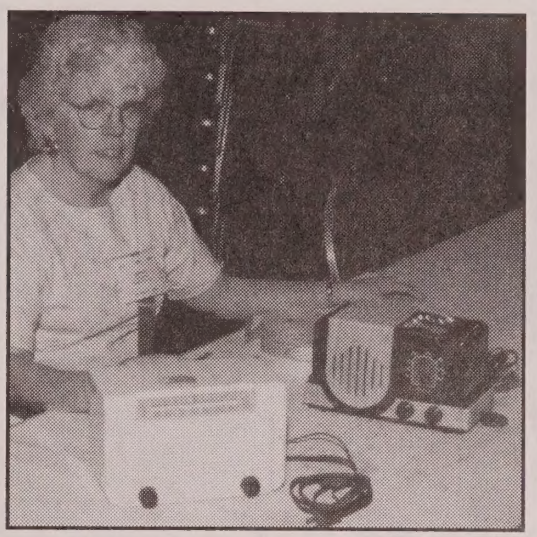


Photos by
Dick Ransley

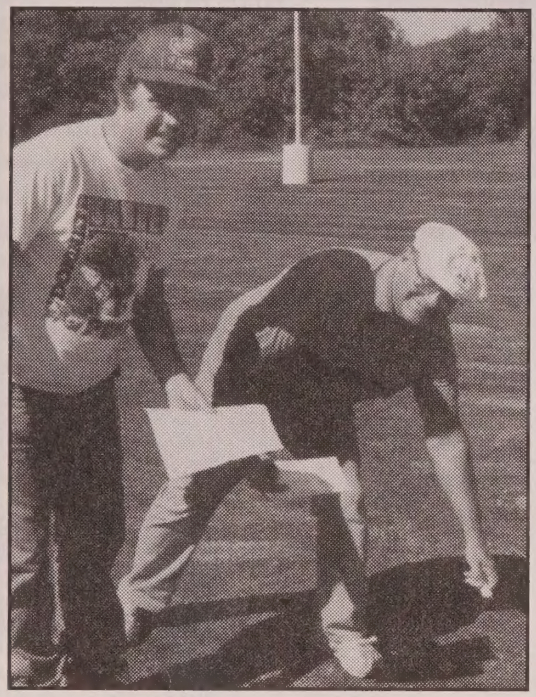
Taking a close look at a pre-1912 wireless receiver at the Wireless and Electrical Aparatus Display



An RJ-4 sold during the auction.



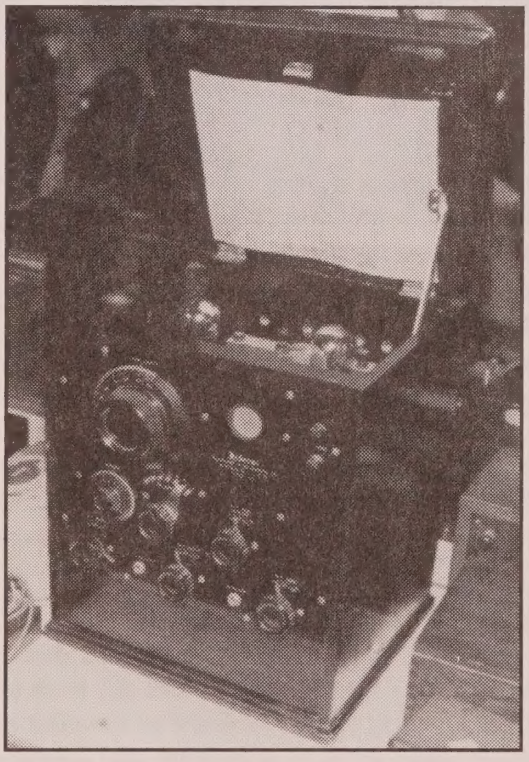
Joyce Peckham checks in some items for the auction.



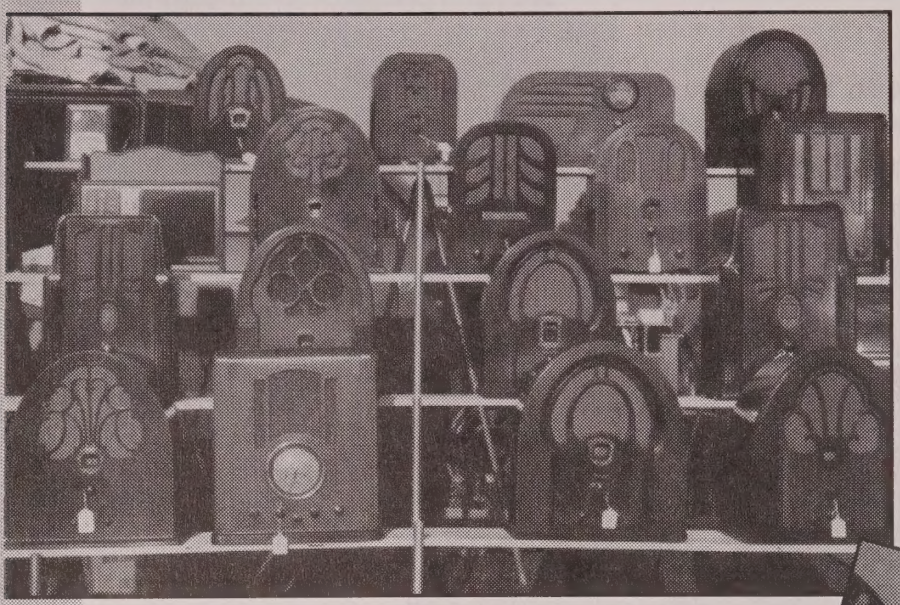
Mike Raide (left) and Ed Gable mark off stalls in the parking lot prior to the flea market.

Photos by
Bruce Roloson
and
Dick Ransley

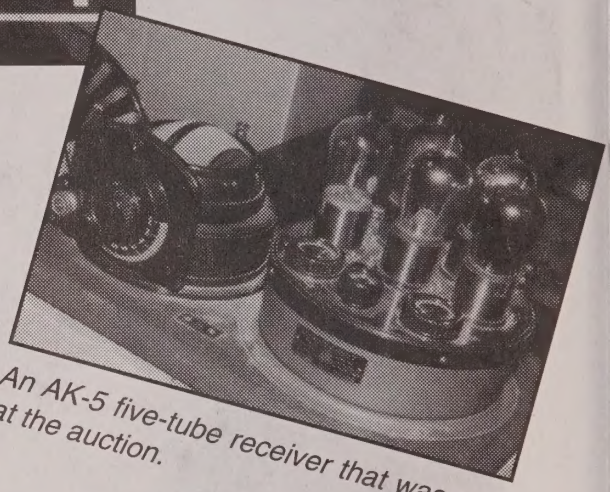
Robert Raide (right) receives the Cundall Award from Bruce kelley.



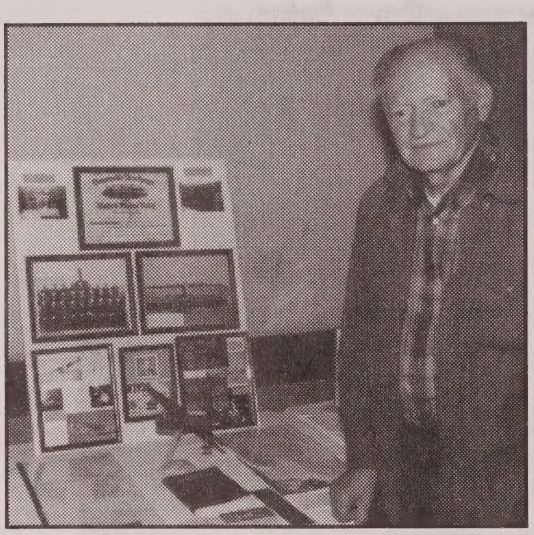
A beautifully restored Federal 110 on display during the annual auction.



You can almost hear the static crackling in the background as the newscaster declares: "Good evening Mr. and Mrs. America and all the ships at sea!"



An AK-5 five-tube receiver that was sold at the auction.



Chet Wisner and his display showing when he was a sea plane radio operator during World War II.

Photos by
Bruce Roloson
and
Dick Ransley

His master's voice?

THE JAMES MILLEN MEMORIAL STATION AT AWA

By
Robert J. Raide, W2ZM* and Williamk B. Fizette, K3ZJW

INTRODUCTION

James Millen, W1HRX, of North Reading, MA, needs no introduction to the reader interested in the development of the communications art through the 1930s. As the father of the famous HRO receiver, considered by many to be the most famous and long-lived single communications device ever produced, he was also the guiding light and chief engineer of the National Company which manufactured the HRO and numerous other receivers and communications gear for more than four decades.

During a September 1983 interview with Jim Millen at his homestead to gather background information on the HRO, K3ZJW was struck by the time-capsule appearance of his famous amateur station, W1HRX; it was the same as it had been back in the 1930s. During this visit a tentative agreement was struck for the W1HRX station equipment to be donated to the AWA museum. Two years later this was finally accomplished when an AWA team led by Bruce Kelley traveled to "The Farm at the end of Tarbox Lane" and moved the gear to the museum annex where it sat on display until the fall of 1993.

HISTORY OF THE STATION

During the 1930s a close relationship developed between the National Company and the nearby headquarters staff of the American Radio Relay League, mainly in the persons of James Millen and Ross Hull, the brilliant editor of *QST.* Hull, a native of Australia and whose brother was the technical editor of the Australian publication *Wireless Weekly,* liked to converse with the folks back home using amateur radio, so the story goes. Millen's station, located at his home in North Reading, state-of-the-art and running the full legal limit, was admirably suited for this purpose. When obtained by the AWA, the station was set for the 20 meter band.

Millen also used the station as a testing ground for National's amateur products, and the published literature of the 1930s included descriptions of the various circuits. In addition to individual components, the station included complete units such as the HRO receiver and the NSA speech amplifier.

* Robert J. Raide
893 East Lake Road., Dundee, NY 14837

The AWA James Millen Memorial Station

ATTENTION ALL RADIO AMATEURS:

SPECIAL W2AN
MILLEN TRANSMISSION

When: Sunday, Dec. 4 and Dec. 11

Time: 3 p.m. to 7 p.m. EST

Frequency: 3867 kc ±

Mode: AM - SSB - CW

To celebrate the restoration of James Millen's famous 1936 W1HRX high-power phone transmitter and his personal HRO communications receiver, AWA staff members will work as many stations as possible on all modes at the times noted. Special attention will be given to CW states on the EVEN hour. An unusual QSL card will be sent to all stations worked. Send QSLs to:

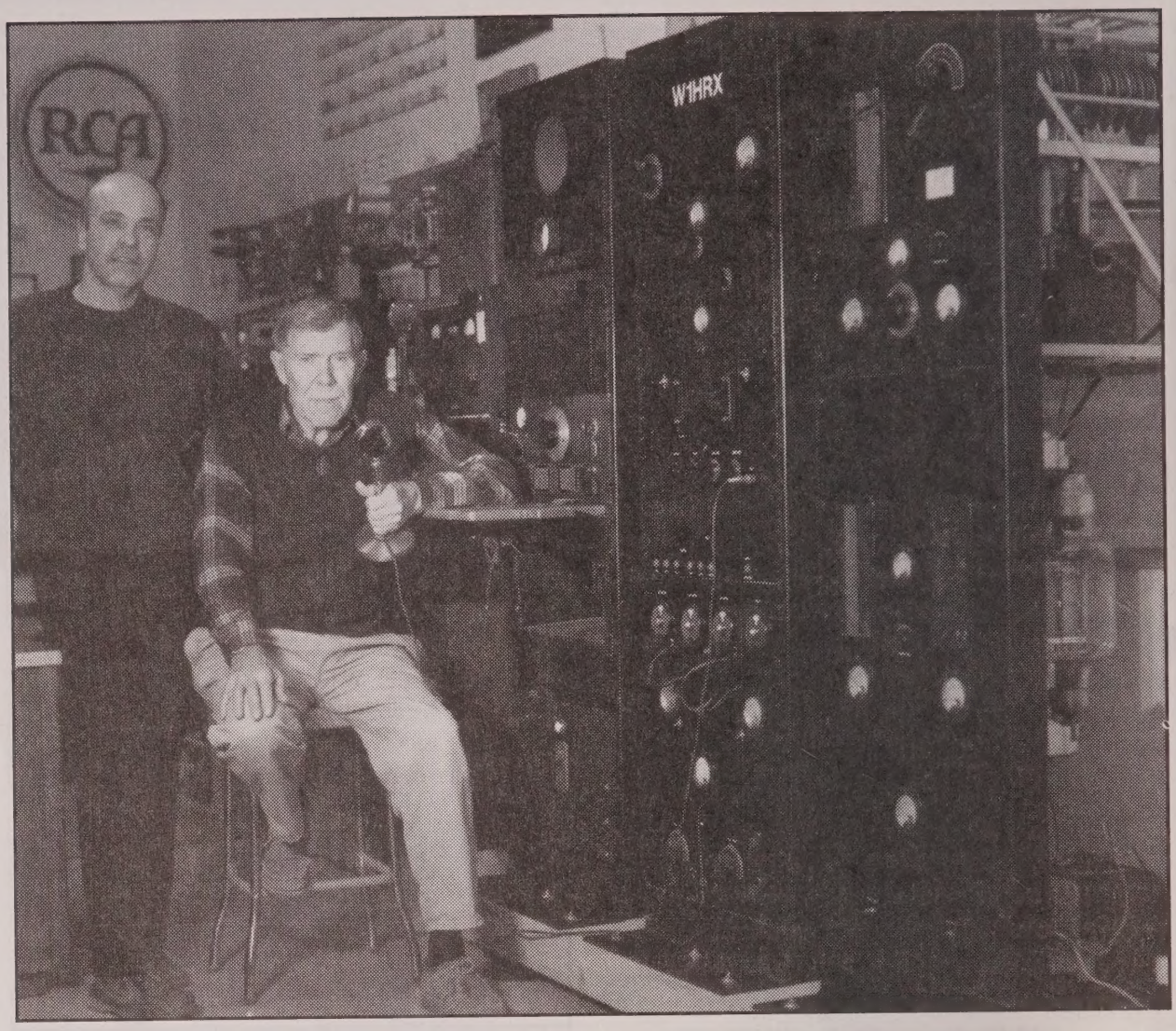
AWA Station W2AN
59 Main St., Bloomfield, NY 14469

RESTORATION OF THE STATION

With the successful restoration of the AWA "Frank Jones 1930s AM transmitter" by W2ZM, the stage was set for work to begin on the Millen station. While conventional wisdom suggested that since the original modulation and plate power transformers were missing and the gear was so old that it was simply not feasible to put it back on the air, the writers accepted it as a challenge. W2ZM, with a commercial radio station background, agreed to redo the transmitter, and K3ZJW to redo the station's HRO receiver. With the blessing and willing cooperation of curator Bruce Kelley, the work began late in 1993. It was essentially completed by March 1994; the Millen transmitter was back on the air.

THE TRANSMITTER

Fig. 1 is a block diagram of the transmitter which consists of several discrete chassis mounted in three six-foot relay racks. A 53-crystal oscillator is followed by a pair of RK20s in push-pull, in turn coupled into the push-pull 204A finals. High level plate modulation uses a pair of 851s driven by a National NSA speech amplifier. Separate power supplies



Bob Raide, W2ZM (left), and Bruce Kelley, W2ICE, at the controls of the Antique Wireless Association's James Millen Memorial Station located at the AWA Museum Annex. The station operates under the call W2AN. The left rack of the restored station contains the operating desk with the HRO receiver directly behind the microphone, and the high voltage supply. The center rack has the IPA at the top with the NSA speech amplifier in the center. At the bottom are the high frequency multiplier stages which are not in use. The rack on the right contains the PA and the modulators. (Photo by Stan Avery, WM3D)

feed the oscillator and the high voltage needs of the RF and modulator sections. A conventional antenna matching unit mounted on the wall couples to the museum antenna, a large open loop.

Using detailed information provided by one of Millen's publications [1], it was apparent that the various chassis were in good shape; nothing appeared overheated, altered or missing. Notable exceptions were the modulation and power transformers, the originals of which were too heavy to transport from their Massachusetts location. Restoration consisted essentially of finding replacements for the missing transformers and reconfiguring the transmitter to transmit on the 75 meter phone band.

POWER SUPPLY AND POWER LEVELS

The HV plate supply originally was a large motor generator driven by a gasoline engine mounted outside the W1HRX shack. It would appear from the literature that the transmitter was operated at the then legal 1 kW input level with 2,200 VDC on both the PA and modulators. Plate current under these conditions would have been about 450 MA, and with the 0-1 amp. panel meter this seems about correct. This is further confirmed by the use of the 15 watt NSA speech amplifier to drive the UV851 modulators.

The immediate concern was meeting the present-day power limits, a maximum of 1,500 watts PEP output. With a plate supply of 1,500 VDC loaded at 300 MA to the 204As, and assuming 75 percent efficiency, an output of 1,350 watts PEP output could

be realized, close enough to the limit. A 1,500 volt supply capable of 525 MA was constructed using a pair of 866A rectifiers in full wave with a two section filter with a swinging choke for the input. The transformer selected was a Thordarson T44929, a 1,800 VAC each side of center.

This supply provided 70 MA to the RK20s IPA, 125 MA on voice peaks to the UV851 modulators, and 280 MA to the UV204A PA stage, a total of 475 MA. The -65 VDC bias supply for the UV851 modulators, heavily bled with a 100-watt rheostat for good regulation, is also included on this chassis.

THE MODULATORS

The replacement for the missing modulation transformer, a 1940s vintage 500-watt Thordarson multimatch type T11M78, was donated by AWA member Jack Wenrich, K2RY, along with the spec sheet, enabling us to set up a 1.15-to-1 primary-to-secondary turns ratio. This appeared to work perfectly, providing 100 percent modulation.

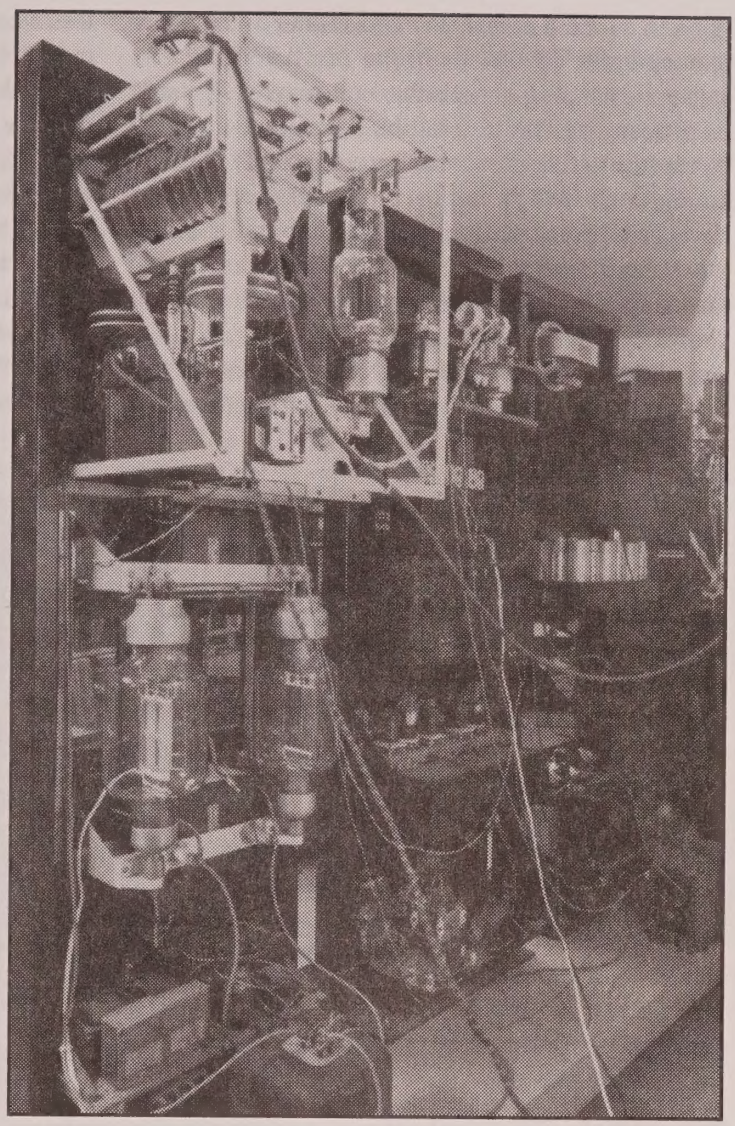
The NSA speech amplifier was made operational by replacing all paper capacitors with matching Mylars. The original can type electrolytics were left in place for appearance, and cartridge replacements were wired out of sight under the chassis.

THE RF SECTIONS

Because the decision had been made to put the transmitter on 75 AM phone and leave it there, it became necessary to move the RF stages from the 20 meter configuration. The crystal oscillator, using one section of the 53 dual triode, was already on 80 meters, and it was only necessary to inactivate the original multiplier stages and drive the RK20 IPA stage directly.

All of the coils and the grid and plate tanks of the RK20s and UV204A finals were wound to 75 meters. The final was a 34-turn, 3-inch coil of #12 copper wire.

On initial test, the original WE 251A 1,000-watt triodes in the final were found to have broken filaments and were unusable; several other 251As were also found to be defective. A substitutes had to be found. The venerable 204A appeared to be the best candidate. It is an early 250-watt triode of similar electrical characteristics and physical dimensions as the WE 251A. Also, with similar grid-to-plate capacity, the original neutralizing capacitors could be used, and best of all, a dozen spares are available. Two new sockets were made and the conversion was a simple matter.



The rear of the James Millen Memorial Station at the AWA Museum. (Photo by Stan Avery)

ON THE AIR!

After the transmitter was neutralized, an abundance of RF was generated on the crystal frequency. Loading a 660-watt dummy load, a using an early D104 crystal microphone, the scope showed "broadcast-quality" audio.

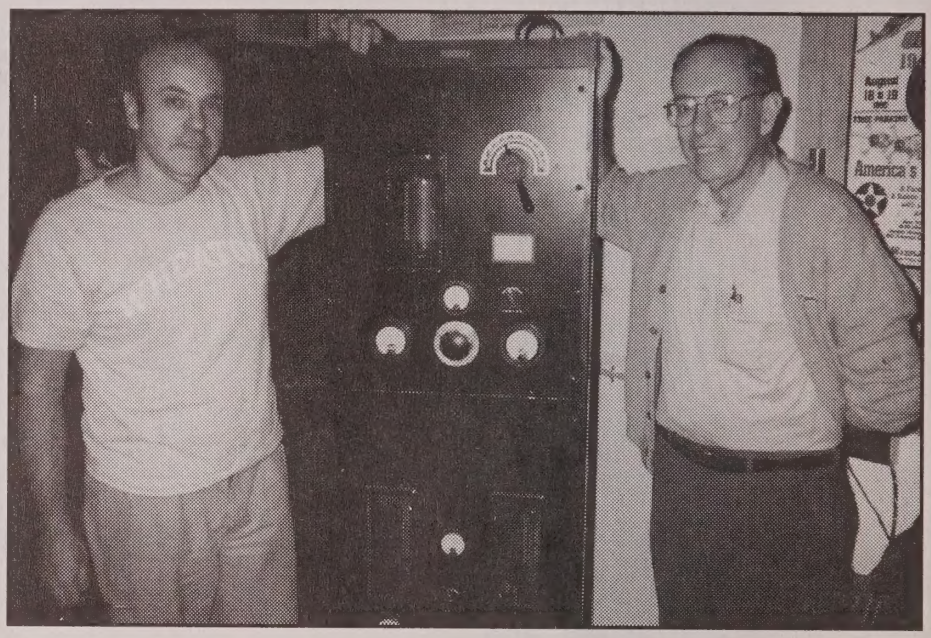
Using a 3,882 kc crystal, the first day of on-the-aid testing dawned on March 19. Immediately a pileup of AMers responded with signal reports of S9 to 40 over, again with broadcast-quality audio. Since then the transmitter has been used ever week. The bugs have been worked out and excellent reports continue.

COMMENT

This transmitter, running the legal limit on 20 meters, and with the modern HRO receiver, was designed to play with the "big boys!" In other words, a 20 meter phone with daytime around-the-world communication capability.

In modern terms, the transmitter is not 'frequency-agile.' The coils in the oscillator and IPA stages are not plug-in but rather bolt-in types. It would have been possible to reset the transmitter for other bands (the tuning capacitors appear capable of maintaining a good "Q" on 80-10 meters), but it would have been time-consuming. Since coils for bands other than 20 meters were not in evidence, it appeared that single-band operation would be the mode of choice.

Special thanks to Bruce Kelley for his encouragement and cooperation once the decision to restore was made, to Mike Csontos for building the roll-around platform that allows the racks to be moved for ease of maintenance, to Mike Raide, KF2MW, and Mike Pires of the annex crew for their continuing contributions.



The authors, Bob Raide, W2ZM (left) and Bill Fizette, K3ZJW, during restoration of Millen station. (Photo by Bruce Kelley)

THE W1HRX STATION RECEIVER

While the Millen AM station receiver was not from the first production runs of the original HRO, it was an early one bearing the serial number L-248 with a calculated manufacture date of February-March 1936 [2]. Specifically, the IFs were the early round type, the panel finish was black alligator, the S-meter switch was the push-pull type, and the inside paint was gray. The tube sockets were marked for the 2.5-volt versions, but the actual tubes installed were the later, improved 6-volt types, a common practice with the earlier HROs.

When first inspected, the receiver appeared on the outside to be in almost mint condition with the original, matched factory coils. However, closer examination revealed that some liquid had been spilled inside the chassis causing considerable corrosion damage to the RF section; this included some of the leaf coil contact springs and it extended down into the coil unit. Unfortunately, the affected unit was the D coil, the one needed for the 75 meter band.

This was the first problem attacked. Three of the leaf springs broke off when lightly touched, and it was necessary to make replacements from some copper-bronze spring stock. Rivets were impractical, so small bolts and nuts were used instead. In the coil gang, sections D2 and 3 were the worse; a number of the rivets were found to be loose, corroded inside the mounting blocks. These were also replaced with small bolts, checking to see that the heads did not interfere with the coil insertion and removal function. The damage inside the coil compartments was cleaned to the extent possible, and the units were then reassembled.

The intent was to use this receiver as an active part of the station, and since it was not considered a particularly valuable collectors' item, aside from the Millen association, the decision was made to completely "recap" the set. This process is absolutely necessary with any older receiver if any serious use is contemplated. The early capacitors are universally leaky, and some of the 400- and 600-volt units from this receiver leaked at as low as 10 VDC. The two cathode electrolytics were left in place for appearance, and small replacements were wired into the circuit. The 24 original paper bypasses were removed and set aside. Replacements, a combination of Mylars and disc ceramics, were checked on a rebuilt Heath capacitor checker for both tolerance and voltage before installing.*

All resistors, the early ceramic versions with the molded metal ends, were checked for tolerance and, surprisingly, they were all good. All the original wiring was in place, and there was no evidence of alterations. All tubes were checked on a good mutual conductor checker and were found good. The PW dial

* An excellent treatise on leakage in early capacitors by D.K. Owens may be found in the May 1994 issue of *OTB*.

was removed, cleaned, relubricated and reinstalled. To add a touch of class, the knob was buffed on a cloth wheel with jewelers rouge to remove some surface scratches.

Incidentally, one of the most frustrating jobs was installing a replacement screw-type pilot bulb; there is almost no room to put a hand down into the limited space. This is probably why it was left out when the set was retubed.

A rebuilt National #697 power supply was used for testing the receiver, and it worked immediately. That is, it worked after the heavy oxide deposit on the power plug pins was removed. The alignment followed standard procedure as outlined in the HRO manual, and it was relatively simple, one of the joys of the HRO design. After all the RF general coverage adjustments were completed, the coils were set up for the bandspread modes on the 80, 40,, and 20 meter bands. The 14-30 mHz coil set was left at the GC position. Alignment was confirmed by tuning in WWV and CHU and checking for tracking across the dial.

After using the receiver for several AM contacts on the 75 meter band, its component design (that is, tubes of the era) shortcomings became apparent. It lacked the sensitivity of later receivers (a 75A-4, for example), and on nets it was necessary to ride the gain controls. On the other hand, the crystal filter controls did enable AM contacts in the face of adjacent SSB channel interference, and the extended bandspread made tuning a delight. When a given frequency was dialed, the station was there every time. Drift on 75 meters, especially for AM, was easily controlled. SSB was trickier, but the receiver was usable even for that. However, to use the S-meter required putting the AVC on, setting the RF gain control to full, and turning on the meter switch. This is rather complicated since the receiver often overloaded and it was necessary to reduce the RF gain to clean up the signal.

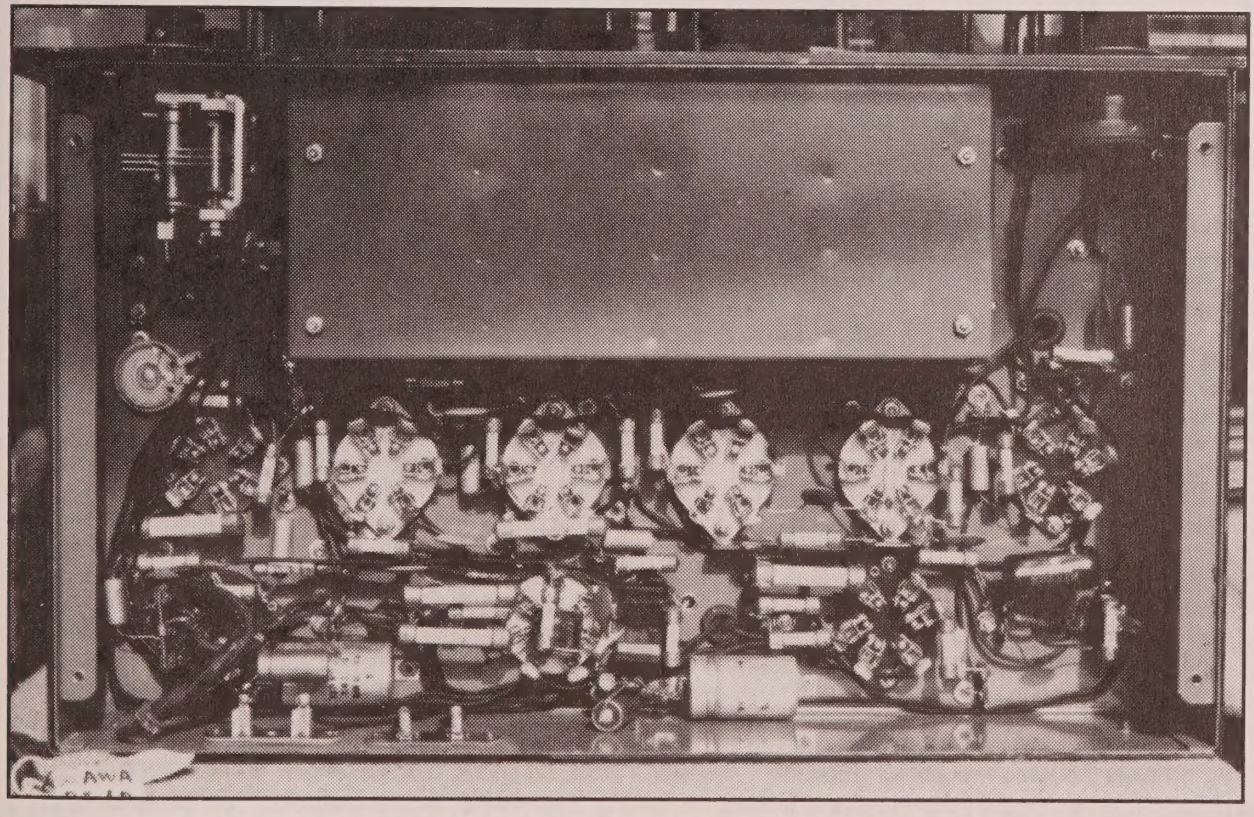
The W1HRX station, complete with the original receiver, continues in operation from the AWA Museum Annex at selected times with a booming signal. The authors are proud to have had a part in restoring to operation this classic and historic amateur station, a fitting memorial to radio pioneer James Millen.

Unfortunately, the original Millen station logs have most likely been lost; the writers have no knowledge of them. What a story they might have told!

REFERENCES

1. Notes on Amateur Radio Transmitter Design, compiled by James Millen, 1938.

2. Dating the Early HRO, by Charles Fisher, *The AWA Review,* Vol. 4, 1989.



The bottom of the Millen station receiver after restoration. (Photo by Bill Fizette)

Dates in the Development of Solid-State TV Scanners and Image Sensors - 1964 to 1984

Prepared by Brother Patrick Dowd, W2GK, in consultation with Paul K. Weimer, Fellow and retired member of the RCA technical staff, Princeton, NJ. An earlier version of this chronology appeared in the December 1985 issue of OTB.

	Company	Date	Ref.
1. First demonstration of solid-state sensors using integrated scanning circuits in place of electron beams (thin-film transistors or TFT).	RCA	19641	1 & 2
2. Showing that silicon photodiode arrays were capable of charge-storage operation with electron-beam scanning. ìPicturephoneî system.	Bell Labs	1967	3
3. Silicon photodiode arrays incorporating MOS transistor for solid-state scanning (MOS/SDA).	Fairchild	1967	4
4. Development of bucket-brigade circuits for charge-transfer scanning.	Philips	1969	5
5. Development of the charge-coupled device (CCD) approach to solid-state scanning.	Bell Labs	1970	6 & 7
6. Development of the charge-injection (CID) image sensor.	GE	1973	8
7. Introduction of commercial image sensors employing solid-state scanning:			
a. Single-line (linear) self-scanned photodiode (SDA) array, 128 elements	Fairchild	1971	9
b. Two-dimensional 32 x 32 photodiode arrays.	Reticon	1972	10
c. CCD arrays (512 H x 312 V).	RCA	1974	11
d. CID camera (100 x 100).	GE	1974	12
e. Color camera for consumer use employing a single MOS/photodiode silicon chip with built-in color filters.	Hitachi	1982	13
f. Introduction of the first ìstudio qualityî solid-state imaging device (403 H x 512 V CCD).	RCA	1984	14

REFERENCES

1. P.K. Weiner, et al., ìAn Integrated Thin-Film Image Scanner,î 1964 International Solid-State Circuits Co Technical Digest, pp. 68-69. 2. P.K. Weiner, et al., ìA Thin-Film Solid-State Image Sensor,î 1966 Internati Solid-State Circuits Conference, Technical Digest, pp. 122-123. 3. M.H. Crowell, et al., ìA Camera-Tube W Diode Array Target,î Bell System Technical Journal, Vol. 46, 1967, pp. 491-495. 4. G. Weckler, ìOperation Junction Photodetectors in a Photon-Flux Integrating Mode,î IEEE Journal of Solid-State Circuits, Vol. SC- Sangster and K. Teer, ìBucket-Brigade Electronics, New Possibilities for Delay, Time-Axis Conversion an IEEE Journal of Solid-State Circuits, Vol. SC-4, No. 3, pp. 131-136, 1969. W.S. Boyle and G.E. Smith, ìCh Semiconductor Devices,î Bell System Technical Journal, Vol. 49, 1967, p. 587. 7. M.F. Tompsett, G.F. An Smith, ìCharge-Coupled 8-Bit Shift Register,î Applied Physics Letters, Vol 17, 1970, pp. 115-116. 8. G.J. H.K. Burke, ìCharge Injection Imaging,î 1973 Solid-State Circuits Conference, Digest of Technical Papers, 138-139. 9. R.H. Dyck and G. Weckler, ìA New Self-Scanned Photodiode Array,î Solid-State Technology, 37-42. 10. ìReticon Solid-State Image Sensor Array,î RA 32x32, Reticon Corp. application note, 1972. 11. III, ìCharge Coupled Imager for 525-Line Television,î RCA Engineer, Vol. 20, No. 1, June/July 1974, pp. 79 ìSolid-State Imaging Systems,î General Electric Bulletin TBD-6235, September 1974. 13. M. Aoki, et al., Format MOS Single-Chip Color Imager,î IEEE Transactions on Electron Devices, Vol. ED 29, No. 4, 1982, 14. E.D. Savoye, et al., ìHigh Sensitivity CCD Images for Television,î 28th Annual SPIE International Tec Symposium, Aug. 19-24, 1984, San Diego, CA.

THE NOVICE COLLECTOR AND HIS FIRST AC SET

Carl Ziegler

Vol. 17, No. 4, March 1977

All-electric receivers made between 1928 and WW II are now the "in thing" with many collectors. This is particularly true with one just starting, who finds locating early battery models fairly difficult.

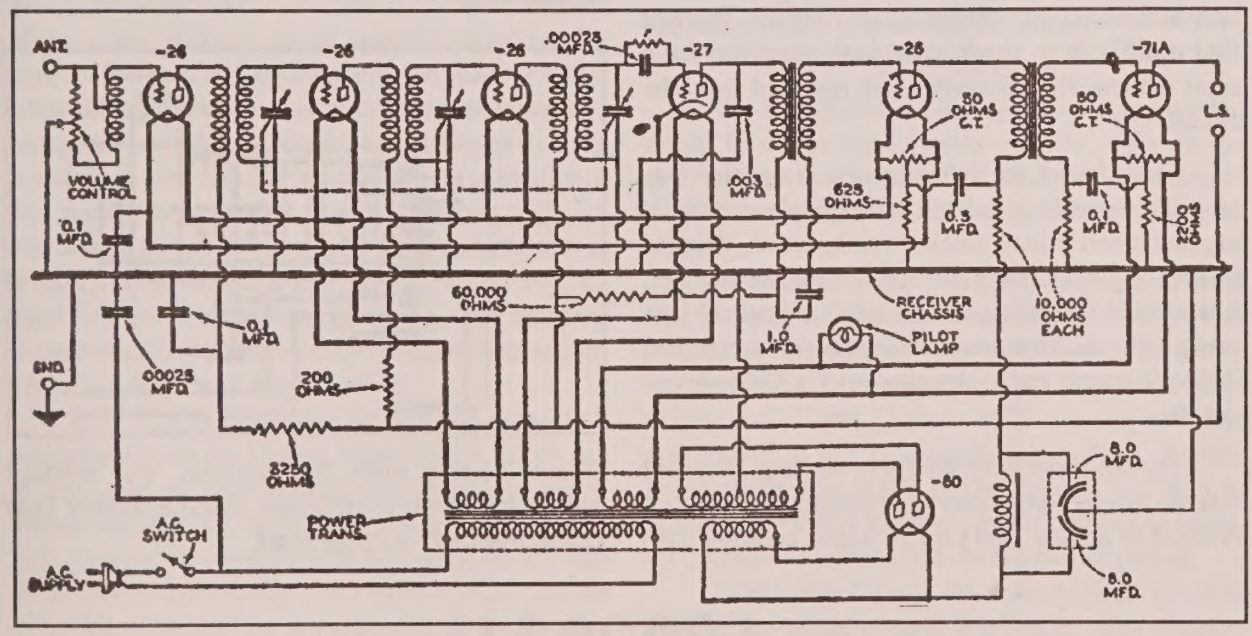
These AC sets are usually housed in attractive wooden cabinets unlike anything made today. A little cleaning and the application of a favorite furniture polish and you have a conversation piece. But what about the set itself?

It is difficult to resist the impulse to plug the cord into the wall socket and snap the power switch — but don't! The set may have been inactive for 45 years and anything could happen. Here is the procedure I follow.

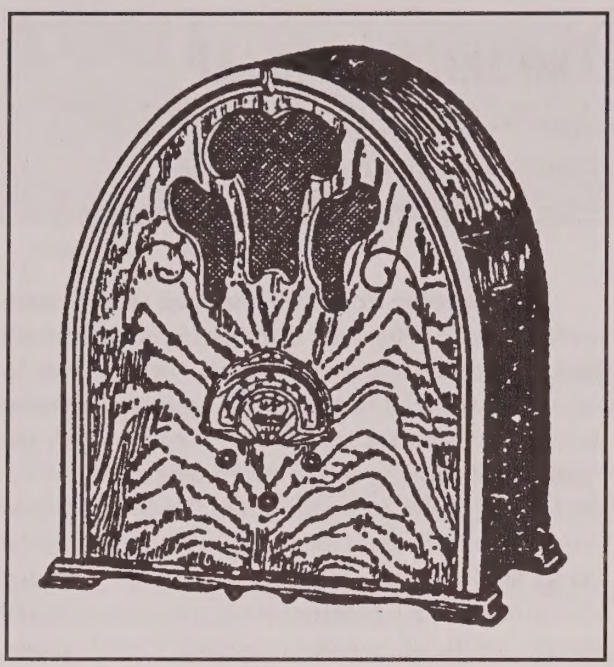
1. Be sure all contacts are clean by working each tube up and down in its socket. It is surprising how dirt and corrosion can accumulate on socket contacts. If the set has such refinements, movement of plug-in coils or a bandswitch may help. Lastly, remove the rectifier tube, usually a 280, from its socket.

2. Now, plug in the cord and turn on the power switch. Try to determine if the power transformer's high-voltage winding has a short. The best way to recognize this with minimum test equipment (and no fuse) is to listen for transformer hum or watch the lights for a slight drop in line voltage. If either occurs, turn off the set immediately. To confirm your suspicion, check the high voltage on each side of the center tap with a high-range AC voltmeter by placing one probe on the rectifier plate connection (small prong) and the other probe to ground. Check voltage momentarily, then try the same on the other plate connection. If there is a wide discrepancy between the two voltages you're in trouble. They should be about the same. Little can be done in repairing such a transformer and the odds of finding a replacement are not good, particularly an early one with multifilament windings for 226s, 227s, 171s and 280 rectifier.

If, however, everything appears normal, check to see if all the tubes light. Most collectors have fairly good access to AC tubes. Keep in mind it is not necessary to replace a defunct tube with exactly the same number. For example: RCA UY-224, 224, 24A and



Typical early set (Crosley 609-610 AC) using three filament voltages and high-impedance output (71-A). Note the double-section electrolytic filter condenser. There is full high-voltage on the speaker, so don't have one hand on the chassis when you plug it in!



A typical AC radio made between 1928 and World War II.

trade numbers such as SX224 and 524 are all interchangeable.

3. Now for the big moment. Reinsert the rectifier tube and again turn on the power switch. Look closely at the rectifier plates. If they begin to show a reddish color or a very distinct blue appears between the filament and plate, turn off the set immediately. There is a short!

When this occurs, the short is usually a filter capacitor. Old wet electrolytic condensers (particularly Mershons) are notorius for shorting out. You will find it difficult to check individual capacitors for a short without first disconnecting one lead from the circuit.

Once found, the collector who is a perfectionist will remove the guts from the original metal housing and insert a new, smaller replacement, thus retaining original component appearance. Remember, it is wise to use replacements rated at least 50 percent greater than the actual voltage in the circuit. In a 200-volt circuit, use a capacitor with a 300-volt rating, etc.

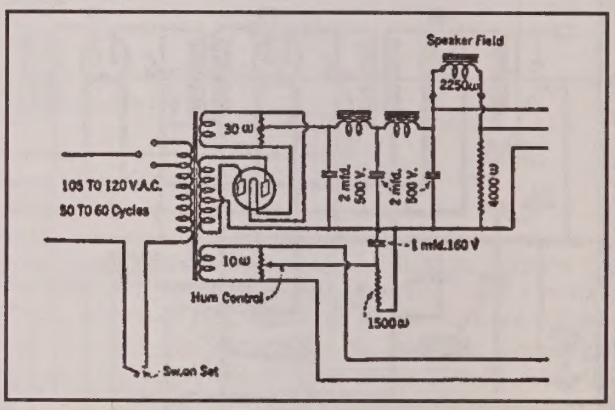
By now, hopefully, the set is working, provided that the bypass condensers and resistors pass the test. A word of advice: don't try to adjust padding condensers. The odds are that the set was aligned when it was discarded 40-odd years earlier. You can try "peaking" a TRF set but not a superhet unless you have a signal generator and the know-how.

A tip on loudspeakers: very early AC sets generally used the same speaker as their contemporary battery models — the familiar high impedance magnetic. However, by 1930 a new type was in general use — the electrodynamic. This type of speaker can be easily recognized by its large field coil and additional connections. In rare cases, a separate power supply was mounted on the speaker chassis to excite the coil.

The most accepted (and practical) method was to obtain the necessary excitation by using the field coil as a filter choke in the high voltage power supply. I bring this to your attention for a good reason. If your receiver uses an electrodynamic speaker and the cone or voice coil is damaged, it is going to be difficult to repair or replace.

The solution is easy. With the speaker field coil in the circuit, measure the voltage across the coil. Remove the coil and replace it with a conventional filter choke. It may be necessary to try several chokes starting with 30 henries and work down to obtain the desired substitute. Be sure the choke can handle the current.

Of course, the old speaker is replaced with a modern permanent dynamic speaker. It is all worth the trouble since, unlike a battery receiver requiring "A," "B," and "C" power supplies, you now have a set that plays!



Power supply with 280 rectifier, but without electrolytic filter condenser. Note speaker field coil in the high-voltage lead.

THE MYSTIQUE OF THREE-LETTER CALL SIGNS

Thomas H. White

Reprinted by permission of the Northern California DX Club's *DXer.*

Three-letter calls are an emotional topic for many Americans. The passing of one leads to mourning and oratory on the need to protect these historic creatures from extinction.

Some misconceptions exist about three-letter calls. This review of the history of these unique calls also covers equally historic four-letter calls.

The continued emphasis on their call signs by American broadcast stations is an anachronism. Most other countries have long switched to slogans or network identification names. One can imagine the cries of outrage if newspapers were forced to identify themselves using government-mandated names like WNYT or WPST. What circulation would a magazine named WTME garner?

Still, with a 75-year tradition, call letters for broadcast stations are fixed upon the American psyche. They also make bookkeeping easier for the FCC (presumably).

ORIGINAL REGULATIONS

The use of call signs is almost as old as radio. *(Editor's note: The term "call sign" is synonymous with "call letters" which the American Heritage Dictionary defines as "The identifying code letters or numbers of a radio or television transmitting station.")* Because nearly all early radio work was by Morse code, spelling out an operator's name, company, or location was too cumbersome. Two- or three-letter abbreviations were more convenient. Operators independently adopted identifying call signs to make it easier to sort out calling stations. Unfortunately, few standards existed in the self-assigned call sign era, and problems occurred when more than one ship or station used the same call. Unique identifiers, assigned on the basis of national origin, were invented to ease identification or exactly what ship was in danger of visiting Davy Jones' locker.

Call sign practice was formalized under federal authority in the United States by the Radio Act of 1912 and by international agreement; the initial letters were allotted among the various nations. The U.S. received all combinations beginning with N and W and the combinations from KDA to KZZ, a total of 1,950 call signs. These were reserved for government, public and limited-service commercial stations. The 1913 edition of *Radio Stations of the United States* records contemporary practice for allocating call signs of land a shipboard stations. There were so few stations then that all could be accommodated by three-letter calls.

Call signs KDA through KZZ were generally assigned to ships in the Atlantic and Gulf of Mexico, and to land stations on the Pacific Coast. Calls beginning with W were reserved for ships operating in the Pacific and Great Lakes, and for land stations on the Atlantic and Gulf coasts, and near the Great Lakes.

This policy was intended to make land and ship stations in any area have different call sign groups. Amateur and experimental stations fell into a separate call sign scheme. The International Bureau at Berne did not even require notification of their existence. The U.S. was divided into nine Radio Inspection Districts. Amateurs received call signs beginning with their district numbers followed by two letters — 8MK, for example.

Experimental stations were assigned a suffix beginning with X. Similarly, a Y suffix designated a technical school station, and Z designated "special amateur status."

The 1913 *Radio Stations of the United States* noted: "The three items — a figure followed by two letters — may be combined in 598 different calls, which will probably suffice for the amateur sending stations in most districts for some time."

REFINEMENTS

The U.S. Bureau of Navigation was required to refine its allocating schemes over the years. In the early teens, most nonamateur land stations engaged in ship-to-shore traffic and were clustered along the coasts.

As other services developed inland, a dividing line between the western Ks and the eastern Ws was needed. It became the Texas/New Mexico border in the south, and ran along the Montana/North Dakota border in the north. Later, in 1923, the east-west line was moved to the Mississippi River. Thus, pioneer broadcasters like WKY in Oklahoma City, WOI in Ames, IA, WHB in Kansas City, and WDAY in Fargo, ND, remain as monuments to the earlier period.

World War I has a disruptive effect. German submarines quickly made shipboard radios a necessity rather than an expensive option for ships making transatlantic runs. There were not enough three-letter calls, so four-letter calls were adopted. KE pre-

fixes predominated. "Turnover" might have helped the three-letter calls last a bit longer, but seafarers — always superstitious — refused the call of a ship that "went down with all hands," for example. Also in this period, the Bureau of Navigation discovered that the world's oceans are connected and discontinued the practice of differentiating call signs by a ship's home port. The less numerous land stations continued to receive three-letter call signs.

With a partiality for vowels, the next major blocks assigned ships were KI__, KO__, and KU__. Perhaps suffering a burst of egalitarianism, the bureau began assigning KD__ calls to both land and ship stations in 1920. Thus the Westinghouse station KDKA was sandwiched between the ships *Montgomery City* and *Eastern Sword.* In 1921, the original system was reincarnated. KDKA is the only surviving station with the fluky call sign produced in this short period.

THE DAWN OF FOUR-LETTER CALLS

The flood of broadcasting authorizations that began in 1921 quickly overloaded the recycling of three-letter calls. The pinch occurred first in the east, and the *Times-Picayune* of New Orleans was given WAAB (now WJBO). There was no WAAA, as rules of the time precluded three of the same letter. Also, the original progression of assignments makes A the middle letter — explaining why so many pioneer stations had calls in the form of W_A_. Several years later, broadcasters began to ask for distinctive calls. In the west, three-letter broadcast calls were still assigned until May 1922.

THREE-LETTER CALLS AFTER 1922

Broadcast station assignment of three-letter calls did not end in 1922, and about half of today's three-letter calls were assigned after this date. Some were special requests and others were "inherited" from earlier, failed enterprises.

The June 30, 1931, edition of *Commercial and Government Radio Stations of the United States* lists 93 three-letter broadcasters — about 15 percent of all American broadcast stations then licensed. These calls did not become rare until after World War II when thousands of new stations were licensed. Three-letter calls continue to be assigned today — to coastal land stations — although even this group threatens to use up its small allotment.

FM AND TV SISTER STATIONS

As FM and TV developed in the '40s and '50s, more call signs were needed. After a short period of requiring each service to have a unique call, the FCC began allowing sister stations to use the same call provided they attached a -TV or -FM suffix. Thus, almost all TV and FM three-letter calls trace back to an original AM station.

Although it no longer owned the station, when WJZ in New York City took the new call WABC, the Westinghouse Corporation was traumatized. Some four and a half years after the disappearance of WJZ, Westinghouse received the call WJZ-TV for its Baltimore station. Technically a five-letter call, it is still exceptional.

CONCLUSION

Some, noting the disappearance of three-letter calls from AM, have accused owners of neglecting their heritage. The opposite is true. When AM holdings are sold, owners often keep the three-letter calls for their FM and TV stations. Only two three-letter calls, saved as independents, have subsequently disappeared from the airwaves.

What about the future? AM radio lacks the financial appeal of old, and more AM stations will be sold; call sign custody will pass to FMs and TVs.

CALL LETTERS THAT HAVE A PAST

(Excerpted from *Popular Radio,* September 1925.)

Call letters that were assigned to ships that met disaster are seldom reassigned to other ships in deference to the superstitions of seamen. They are, however, reassigned to broadcast stations. For example:

• KJS, now the Bible institute of Los Angeles, was used by the steamer *North Star* when on a foggy morning in August 1919 a call for immediate assistance was set out by the radio operator of the vessel. Radio helped rescue all 348 persons on board.

• WSB, now the station of the *Atlanta Journal,* was formerly assigned to the steamer *Francis H. Leggett* which foundered off the Oregon coast on Sept. 18, 1914, with 67 persons on board, two of whom were lost. After this wreck the call was reassigned to the steamer *Firwood* which burned off the coast of Peru on Dec. 18, 1919. All 28 persons on board survived.

• WHN, now the station of Loew's Theatre, New York, was at one time assigned to the steamer *Hanalei,* later wrecked. It was then used by the steamer *Santa Isabel* which was sold to citizens of Chile, releasing the call for reuse.

• KLZ, Reynolds Radio Co., Denver, was the call of the steamer *Speedwell* in 1920. KLZ and SOS were an important combination of signals on Sept. 29 of that year when the *Speedwell* was caught in a tropical hurricane in the Gulf of Mexico. The storm was so severe that after the distress call and position of the vessel were sent out, the engine room became flooded, the dynamo ceased to work, and the sea carried away the whole afterdeck, taking with it storage batteries to operate the radio. This catastrophe caused

the loss of nine lives, including the captain, mate, and two women passengers, out of 25 on board.

• KGB, now assigned to the *Tacoma Daily Ledger,* was used by the *D.N. Luckenbach,* sunk by a submarine about 100 miles off the French coast on Dec. 27, 1917.

• WGR, Federal Tel. Mfg. Co., Buffalo, was previously used by the passenger steamer *Governor.* the *Governor* sank in a collision with the freighter *West Hartland* in April 1921. Eight lives were lost.

• WWJ, once the call of the steamer *Peru,* is now used by the *Detroit News* station. The *Peru* was transferred to the French flag, causing cancellation of the U.S. call letters.

• KLS, now assigned to the *Oakland Tribune,* was formerly assigned to the steamer *Kermanshah* which was transferred to the Hungarian flag.

• KOB, New Mexico College of Agriculture and Mechanical Arts, was used by the steamer *Princess Anne* up to the time she stranded on Rockaway Shoals, Long Island, Feb. 6, 1920, with 106 persons on board, none of whom were lost. The *Princess* broke in two and the cargo, valued at $500,000, was practically a loss.

CALL SIGNS AS INITIALS; SLOGANS FROM CALL SIGNS

The issuing of initials for call letters is not new. Glancing through broadcast station call lists of the 1920s found the following. Besides calls that followed the licensees' initials, sloganeers quickly force-fitted mottoes to fit existing calls, reflecting Twenties boosterism with some amusing results.

KFH — Kansas' Finest Hotel
KFHL — Keen for Higher Learning
KFNF — Known for Neighborly Folks
KFOB — Kind Fellows of Burlingame
KFQB — Keep Folks Quoting Bible
KFRC — Keep Forever Radiating Cheer
KFWO — Katalina for Wonderful Outings
KGW — Keep Growing Wiser
KHJ — Kindness, Happiness, Joy
KJBS — J. Brunton & Sons
KLDS — Latter Day Saints (church)
KMA — Keeps Millions Advised
KOAC — Oregon Agricultural College
KOCH — Omaha Central High School
KOCW — Oklahoma College for Women
KPSN — *Pasadena Star-News*
KQW — King's Quickening Word
KSAC — Kansas State Agriculture College
KSEI — Kummunity Southeast Idaho
KSL — Salt Lake
KSO — Keep Serving Others
KTAB — Tenth Avenue Baptist (church), and Knowledge, Truth and Beauty
KTHS — Kum to Hot Springs
KUOM — University of Montana
KUSD — University of South Dakota
KUT — University of Texas, and Kum to the University of Texas
KWFH — W.F. Henderson Co.
KWKC — Keep Watching Kansas City
KWWG — Kum to the World's Winter Garden
WAAW — Where Agriculture Accumulates Wealth
WABC — Asheville Battery Co.
WADC — Watch Akron Develop Commercially
WAHG — A.H. Grebe (Company)
WAIT — A.H. Waite (Co.) and We Are In Taunton
WAIU — American Insurance Union
WAPI — Alabama Poly Institute
WARC — American Radio (Res.) Company
WBBM — World's Best Broadcast Medium
WBEN — *Buffalo Evening News*
WBES — Bliss Electrical School
WBIG — Where Business is Good
WBRC — Bell Radio Corp.
WBRE — Baltimore Radio Exchange
WCAP — Chesapeake and Potomas (Tel. Co.)
WCAU — Where Cheer Awaits U
WCFL — Chicago Federation of Labor
WCUW — Clark University at Worcester
WCWS — C.W. Selen
WDCH — Dartmouth College at Hanover
WDRC — Doolittle Radio Corp.
WEAN — We Entertain A Nation
WEBH — Edgewater Beach Hotel
WEEI — Edison Electric Illum. (Co.)
WEMC — Emm. Missionary College
WFBL — When Feeling Blue, Listen
WGBS — Gimbel Bros. Store
WGHB — G.H. Boules
WGHP — G.H. Phelps (Inc.)
WGST — Georgia School of Technology
WHEC — Hickson Electric Company
WIBR — Where Investments Bring Results
WIBW — Where Investments Bring Wealth
WICC — Industrial Capital of Connecticut
WIP — Watch Its Progress
WKBE — K. & B. Electric (Co.)
WKBF — We Keep Building Friendship
WKRC — Kodel Radio Corp.

WLBM — Where Listeners Become Friends
WLS — World's Largest Store (Sears)
WLTS — Wisconsin, Land of Beautiful Lakes
WMAL — M.A. Lewis (Optical Co.)
WMAX — Watch mercer Attain Zenith
WMBD — World's Most Beautiful Drive
WMBH — Where Memories Bring Happiness
WMCA — Hotel McAlpin
WMPC — Where Many Preach Christ
WMSG — Madison Square Garden
WNBH — New Bedford Hotel
WNYC — New York City (municipal station)
WOW — Woodmen of the World
WOWL — Owl (Battery Company)
WPCC — We Preach Christ Crucified
WPSC — Penn State College
WRC — Radio Corp. (of America)
WREO — Reo (Motor Co.)
WRHM — Rosedale Hospital of Minneapolis and Welcome Rosedale Hospital Minneapolis
WSAN — We Serve Allentown Nationally
WSBC — World Storage Battery Station
WSBF — Stix Baer & Fuller
WSBT — *South Bend Tribune*
WSM — We Shield Millions
WSMH — Shathick Music House
WSOE — School of Engineering
WSUI — State University of Iowa
WSUN — Why Stay Up North?
WSVS — Watch Seneca Vocational School
WTIC — Travelers Insurance Company
WTOC — Welcome to Our City

MORE HEADSETS — A CANADIAN VIEW

Dennis Chappel
245 Bristol Street, Apt. 308, Guelph, Ontario, Canada N1H 3M3

With reference to your master list of head sets (*OTB,* February 1992 [Vol. 32 No. 4, p.46], plus letters in May 1992 [Vol. 34 No. 1, p. 40]), I would like to contribute the following eleven names of sets in my collection that are variations or or not included in the list.

• Chas. A. Branston, Inc., Buffalo, NY ("C.D." on the master list): Branston "Standard" 2500 ohms.

• C.F. Cannon Co., Springwater, NY: Cannonball Empire.

• Haliburton & White, Ltd., made in Canada: Radio Blue 1100 ohms.

• Moss-Schury Co., Detroit: Repeater 1200.

• Musicone Balanced Headset, 2000 ohms, a Crosley product.

• National Electric: 1000 ohms, manufactured by the National Electric Heating Co., patented 1931; 528.

• Perkins 3000 ohm phone, manufactured by Warren Radio Phone Mfg. Co., Montreal, Canada.

• Radiolec London Can.

• Starco, Montreal, Canada.

• Toronto Radio Co., Toronto, Canada: Toraco 3000 ohms.

JOHN A. MYERS CALLED TO REST

Larry Babcok informs OTB that John Adams Myers, 78, of Lake Street in Wilson, NY, passed away Sept. 4 in Buffalo following open heart surgery.

"John was almost 79 years old but looked and acted as a man at least 10 years younger, right up until the day he entered the hospital," Larry, a very close friend of John, writes. "He was given a triple bypass operation and shortly later experienced a heart attack. The doctor said he was unable to cope with both the surgery and the heart attack. He will be sorely missed..."

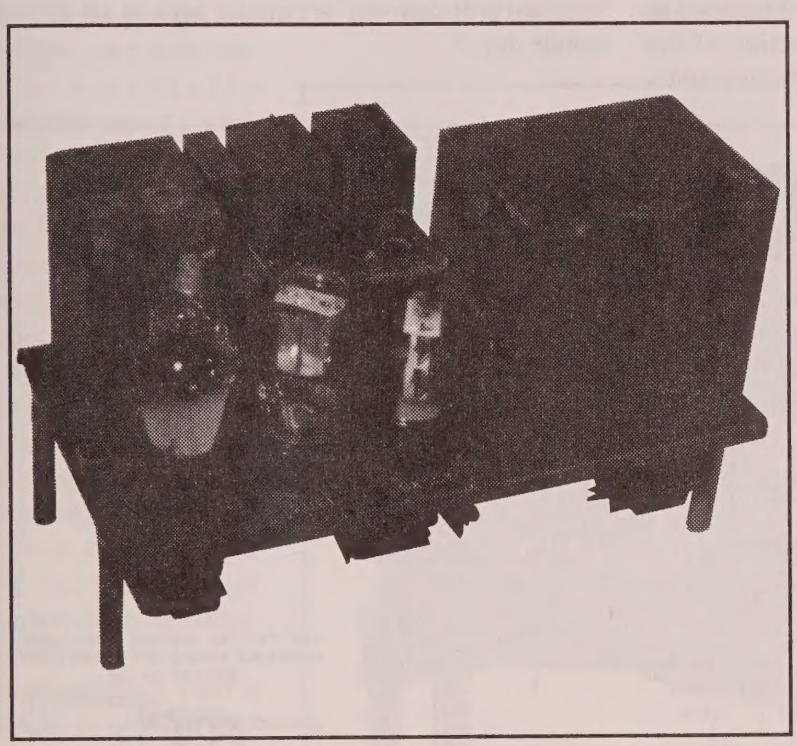
John was a past president of the Niagara Frontier Wireless Association and was very active in the Antique Wireless Association. He always helped with the auction at the AWA's annual meetings. He was also a member of the Ransomville Masonic Lodge, the Wilson Lion's Club and the Exley United Methodist Church.

Survivors include wife Eleanor, daughters Sue Myers of Mallorca, Spain, and Kay Wright of Sandusky, OH, sons John Jr. of Palo Alto, CA, and Richard of Oakland, CA, and three grandchildren.

CARRIER-OPERATED LOUDSPEAKER CONTROL — 1940s STYLE

David C. Ivarson, W3WBE
5 Church Road, Collegeville, PA 19426

When you purchase a communications receiver today, you expect it to have a squelch control as part of its built-in circuitry. On earlier receivers, however, this feature had to be provided externally when needed.

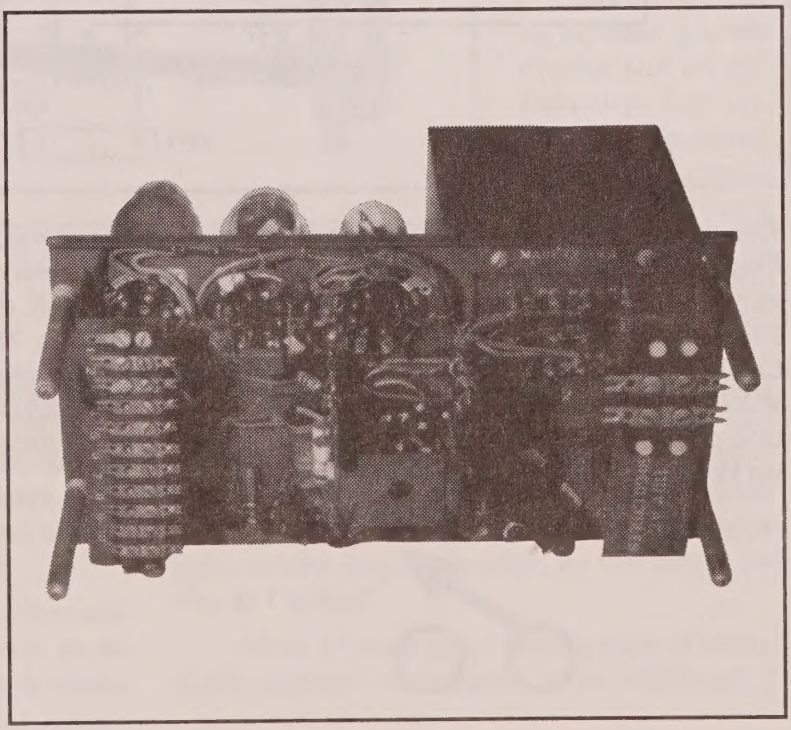


The device shown in the photos is a Model 3-A Carrier-Operated Loudspeaker Control Panel manufactured by the Langevin Company of New York for the Signal Corps. This device provides receiver silencing in the absence of an incoming signal by sensing the AVC level and triggering a relay for speaker control. Four isolated relay contacts, two normally closed and two normally open, allow control of recording devices as well as speaker control.

The tube lineup comprises an 85 as a DC input amplifier, a 6H6GT noise rectifier, a 2051 thyratron for relay control, and a 6X5GT rectifier. There is a fail-safe feature in the form of a second relay whose coil is used as a filter choke in the DC supply. In the event of a power-supply failure, contacts on this relay open to disable the speaker control relay and return the receiver to normal operation.

A noise-rejection feature prevents the speaker-control relay from being triggered by static pulses up to 40 dB above the minimum carrier level that will operate the unit, up to the point where noise overloads the receiver and causes an AVC level shift. As shown in the schematic, the noise rectifier circuit is arranged to hold off the thyratron during transients.

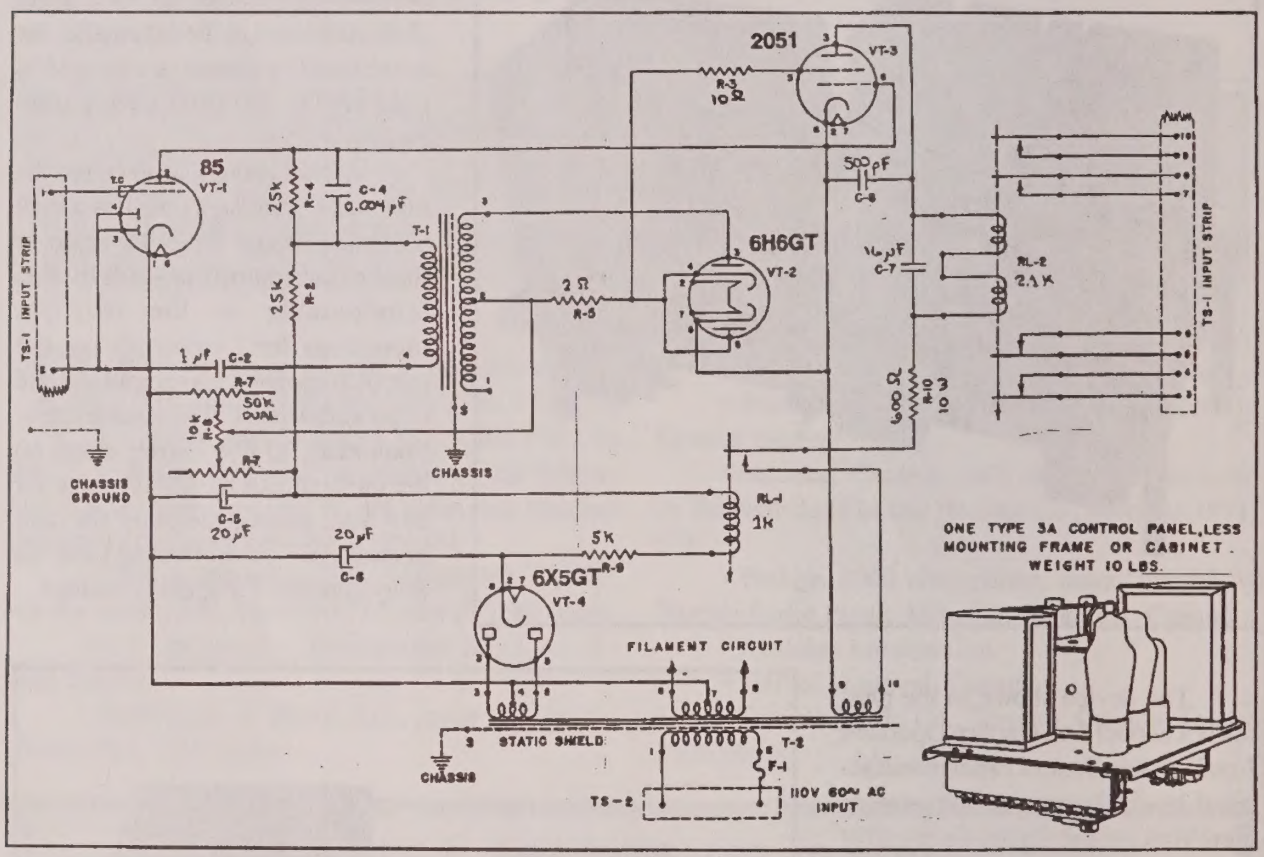
A wall-mount cabinet for the unit was available, as well as a rack mounting frame for holding up to three of the control units side by side (comparable to the multiple mountings for Langevin's regular line of microphone preamplifiers and other audio gear). Electrical connections made at two barrier strips on the underside of the chassis: one for 115 VAC mains, the other for connecting AVC control voltage and the relay contacts for speaker control.



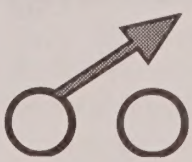
A FINE sensitivity control is located on a bracket near the center of the unit. This bracket can be moved to the other side of the chassis to suit various installation arrangements. A screwdriver adjustment is provided for setting coarse sensitivity to accommodate a wide range of AVC levels of 0.2 volt or more. Setup instructions call for observing the glow of the 2051 thyratron to determine the trigger point. According to the instruction manual, these devices were intended for use with the Hammarlund Super Pro (the Signal Corps' workhorse BC-779, BC-794, BC-1004, R-129/U, and R-270/FRR), but would work with nearly any superheterodyne receiver since the floating circuitry would allow connection to either grounded or biased detectors. The maintenance section of the manual gives resistance and voltage charts for troubleshooting, and recommends the use of an RCA Volt-Ohmyst, Jr. (remember those?) for measurements.

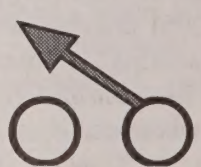
Although Uncle Sam (read: taxpayers) probably paid top dollar for them, these devices were sold cheaply on the surplus market of the early '50s and were a good source of parts. There were other applications for the Model 3A. For example, a light detector or alarm system could easily be fashioned by connecting a phototube to the input terminals.

As evolution of the squelch control continued, these devices became smaller before the circuit finally moved to the inside of the receiver cabinet. Does anyone remember the Gonset TNS (Twin Noise Squelch) unit that was so popular back in 10-meter mobile days?



This device, like most early Langevin equipment, shows strong parallels with contemporary Western Electric gear, down to the rectangular-case W.E.B-type relays. Bell Labs had developed a wide variety of signal-processing equipment for production by W.E. during the '30s, initially for transocean and ship-to-shore HF radio, then for mobile and aircraft use. This included devices with names like CODAN (Carrier-Operated Device, Anti-Noise), NODAN (Noise-Operated Device, Anti-Noise), VOGAD (Voice-Operated Gain Adjusting Device), and VODAS (Voice-Operated Device, Anti-Singing). One can suspect a transfer of BTL CODAN's designs to Langevin through W.E. license, possibley via W.E.'s Electrical Research Products Corp.



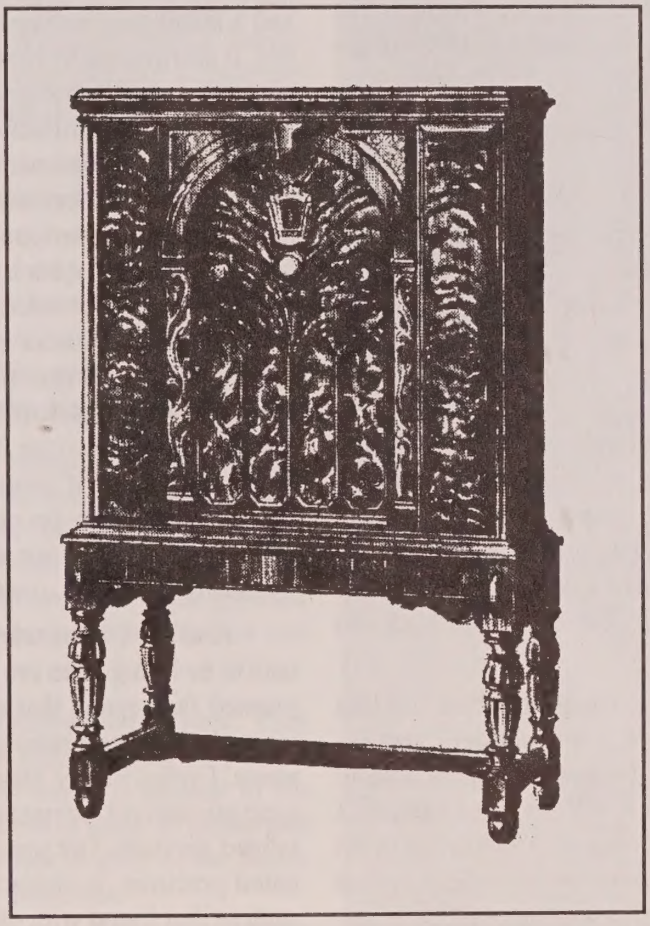


AN ESSAY

A PSYCHOLOGICAL FOOTHOLD

Anton G. FitzGerald
83 Highfield Lane, Southampton, SO17 INN, England

Dr. David Mednick's article on the psychology of collecting, caused me to think of the occasions when I have stared in wonderment at the gathering of old fashioned paraphernalia stacked around my den, and likewise, at the old cars in my garage. Aught I to rid myself of all this bother, get a new, 'environmentally friendly' car and stick solely to modern, state-of the-art audio? For it could be sensibly argued that there are much more important things I could be doing with my life than collecting old 'junk.' Yet that old junk plays a considerable role in sustaining for me, a certain degree of sanity. But it is a form of materialist possessiveness; nonessential to healthy living. And it would be no good consulting my doctor about it as he has a similar condition and would probably advise that a 'cure' may induce further complications!



A 1930 Philco console.

Although I've never before, needed to justify my reasons for keeping a "load of ole junk" strewn around the place, the exercise does help to rationalise things slightly for me. Philistines may well differ, but I do regard these old relics as works of art. And it is in man's very nature to appreciate beautiful things. Beauty of course, being in the eye of the beholder, who's to argue?

Psychologists would probably say that self-analysis does not hold. But that depends on the individual's level of sanity and powers to reason. (I'll refrain from publicising any declarations regarding my own levels, but I am sometimes reassuringly comforted by extraordinary encounters that I've occasionally had with other individuals). Infatuation with old paraphernalia is regarded by many outsiders as an eccentricity. But a collector's eccentricity should surely be measured in terms of the value in their exerted effort — and sometimes, effort in a misplaced value. Considerations such as fulfilling a moral obligation towards the rest of the planet come into play. But the philosophical issues could be muddling and ruin incentives! Yet on that note, I see that the planet does benefit: its people become united by a common interest.

As with most of us, my heart is in the present and for the technology that carries us into the future. So, with due respect for Henry Ford's well-known sentiments regarding history and in this constantly expanding scientific world, why do I (and others) indulge in old time technology? Contact with old machinery and electrical apparatus switches me on to inwardly glow like a filament in a tube. The experience excites something in my system that has nothing to do with logic. Neither does a love affair, for that matter. So why do I bother?

About 14 years ago, I heard a piece of music which triggered off memories of my childhood. I

was approaching my 40th birthday at the time and nostalgia flowed easily. I know that it is not wise to dwell on the past, but it does occasionally serve as a foothold for the present. My reminiscences took me back to the homely times when my younger fingers twiddled with the knobs on my father's Philco 444: the thrill of picking-out strange sounding names on the tuning scale, to listen to those foreign voices and check their location on the map. And of course all those lovely BBC [British Broadcasting Corporation —Ed.] programmes: there was something very special about the sounds of the post-war period; a sort of wholesome charm which reflected the mood of the people. The comedy and music had a natural purity of style, and the radio dramas exercised the listener's powers of visual creativity. Today, home entertainment in general, denies children that experience, for there is little left to test their imagination.

Indeed, I have fond memories of that old Philco, it "lived" in our home; warm and friendly like a log fire. Or was it a delusion? But inevitably it had to be replaced when new trends came into being, and sentimentalities served no useful purpose. And so, 25 years later, that nostalgic moment of music had created the desire to once again bring into my life a "444." I yearned to turn the clock back so as to tune in on those happy days of youth; to restore my relationship with my old Bakelite friend. Alas, at an auto-jumble at Beaulieu, I eventually found one; and after a thorough overhaul, fired it up. It worked. But of course, it had one big failing; it couldn't tune-in to those nice old programmes! The sensation was incomplete. Yes; to go back can often be disappointing.

During my searches, the old fire that had lain dormant within me since I left college, was rekindled: As a youngster I enjoyed playing around with all sorts of mechanical and electrical gadgets. I had a fascination for anything that moved or lit up and would often spend time dissecting them to find out how they worked. I also had a natural fascination for anything that produced a sound. These interests inevitably combined to develop as a hobby in radio constructing. For my experiments I would cannibalise ex-government equipment, which during the mid-50s was available from junk shops. I also became the recipient of old domestic receivers which were donated by my parent's friends; glad to contribute towards a young lad's happiness and add to my rising clutter at the displeasure of my parents — they too were cannibalised (the radios — not my parents)!

I eventually parted company with my accrued radio stuff to enter the big professional world and had taken on other interests. In the light of present knowledge, I am horrified by what I now regard as my acts of vandalism — such lovely items that passed through my hands and lost forever. (I'll spare the details for fear of causing nervous upsets among fellow enthusiasts). And now, as if desperately attempting to make amends for my past misdeeds, I seek to collect and restore.

From that rekindling of old interests, I had fired-up an acquisitive trend, falling prey to anything relating to that early period of sound and signal reproduction. I soon became a member of the British Vintage Wireless Society and subsequently, other similar organisations. My involvement in this fraternity not only stimulated my interests, but it also had a stabilising influence on my collecting activities. It allowed me to view my interests with a wider perspective and to become more relaxed and be contented to trim my collection down to a fairly modest selection. My assortment of ancient paraphernalia retains for me that certain foothold in the past. With it, I can almost experience the excitement that must have prevailed way back in those glorious pioneering years, when inventors and innovators were exploring the newly discovered medium. Those people in particular I admire; they at the very beginning with such limited scientific resources, were setting the foundations for the future. A time when, after many thousands of years of intelligent life, mankind had eventually become aware of the forces that naturally existed in our universe. Its initial impact on ordinary mortals, must have been as magic.

And now, I consider myself to be very fortunate to be living in an era when technology has progressed far beyond that early magic. It has served me well, both professionally and for my own purposes. I value highly, state-of-the-art audio with its sophisticated refinements and clinically clean, digitalized decibels. But preserved in my relics of outdated practices, is character; almost immortalised, such as that found with old steam engines and automobiles. They display themselves proudly on the shelves around my den as if to pay tribute to their makers. Each component fashioned to be aesthetically pleasing as well as to perform its intended function: Robustly constructed with their beautifully engineered chunks of brass, moulded Bakelite and various coloured cotton bound wires. Gracefully formed glass globes encapsulating intricate electrodes. They are artistic creations. There, as a dedication to an early craft and to remind me of the beginning.

...My foothold will remain so.

THE LOUDSPEAKER

EDITED BY
Floyd A. Paul, W6THU
1545 Raymond, Glendale, CA 91201
All correspondence requires SASE for reply.

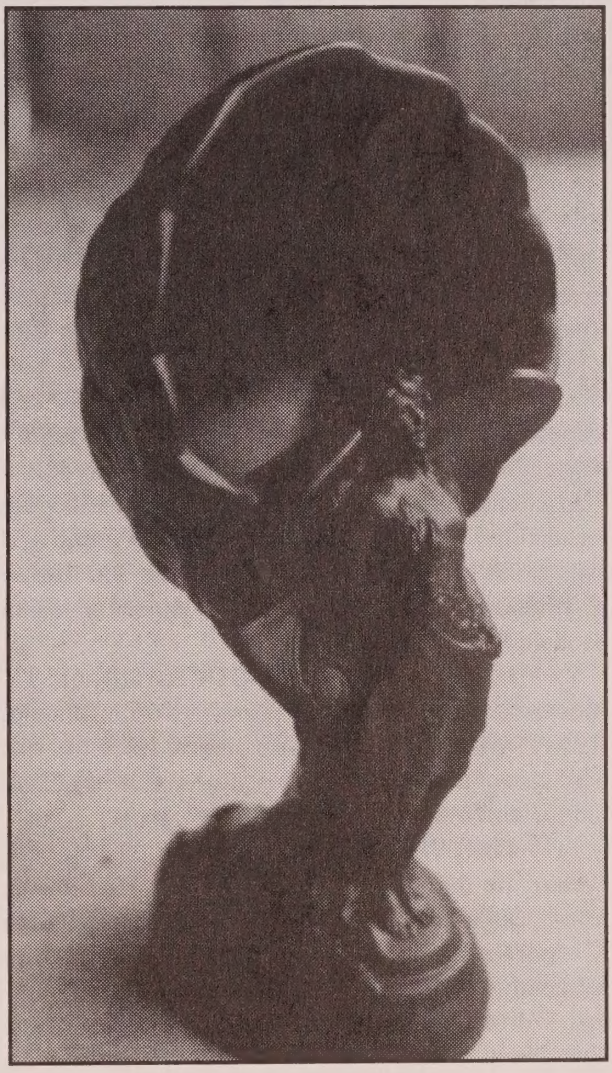
FLORENTINE ART PRODUCTIONS, INC.

Florentine Art Products Co. of Chicago was listed in a McGraw Hill *Radio Trade Directory* speaker listing of August 1925. A February 1926 *Radio Trade Directory* listed the company as Florentine Art productions, Inc.

The first publication to show a picture of the Voice From the Sky was believed to be in a Loud Speaker Encyclopedia listing in the September 1925 issue of *Electrical Record* magazine. *Radio News* magazine's first and only advertisement of December 1926 showed a picture of the Voice From the Sky and described it briefly. The advertising budget of the company must have been very modest.

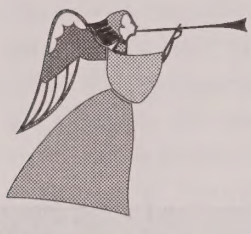
The few descriptive words in the ad told: The design was patented by L. Romanelli, 24 inches high, bell diameter of 12 inches, finished in walnut, mahogany and ebony. The horn is made of "Italian Gesso" (a plaster of Paris or some other gypsum material —Ed.), a Utah driver is used in the base and the unit is priced at $30.

The horns are attractive and unique. This writer's speaker, shown at right, weighs 18 pounds which makes it among the heaviest speaker in his collection. With an air column of some 20 inches and a Utah driver, the horn sounds as good as the Music Master horns in the same collection.



RECENT RADIO, TV AND ENTERTAINER OBITUARIES

Charles S. Griffen, W1GYR
1225 New Britain Avenue, West Hartford, CT 06110-2405 (203) 232-8515



• **BILL BAKER,** former lead singer of the '50s do-wop group The Five Satins. Their greatest hit was "In the Still of the Night" recorded in 1956.

• **HARRY BELLAVER,** 88, theater and TV character actor. He played the role of Sergeant Arcaro on the television series *Naked City* from 1960 to 1964 and Chief Sitting Bull in the Broadway play *Annie Get Your Gun.*

• **AL BLAND,** 88, radio performer and executive. His career began in 1928 as a writer/performer on WSAZ-AM in Huntington, WV. In the 1950s he became vice president-corporate programming for the five AVCO television stations and WLW-AM in Cincinnati.

• **JAMES (Pat) BOOE,** 87, early radio and capacitor engineer. He was employed by the Mallory Capacitor Co. from 1930 to 1972, and served as a consultant to the firm until its breakup in 1986. He headed the aluminum capacitor research group and was involved in the development of the 200 degree C/10,000-hour "XT" wet-tantalum capacitor which is manufactured to this day.

• **HENRY K. (Hank) BOUCHARD,** 68, TV weather forecaster. He was associated with Channel 12 in Providence, RI, for more than 30 years. He was also host of *Dialing for Dollars,* played Cowboy Hank on the children's show *Salty's Shack,* etc.

• **JOSEPH CAIRO,** 84, self-taught radio engineer. He designed radios for Atwater Kent in the early 1930s and after three years joined the Philco Corporation. He spent the next 39 years at the company's plants in Kensington and East Falls. During World War II he supervised the design of test equipment for radios and other electronic devices for the military.

• **JANIS CARTER,** 80, TV show co-host and film and Broadway actress. Broadway credits include *DuBarry Was a Lady, Panama Hattie,* etc. She appeared in some 30 films, such as *Cadet Girl* (1941) and the Lucille Ball comedy *Miss Grant Takes Richmond.* In the mid-1950s she co-hosted the daytime show *Feather Your Nest* with Bud Collyer.

• **DOROTHY COLLINS,** 67, singer. She rose to fame singing "Be Happy, Go Lucky" for Lucky Strike cigarettes on television's *Your Hit Parade."* In the 1960s she appeared on Allen Funt's *Candid Camera."* During the 1940s she sang for bandleader Raymond Scott.

• **PETER CUSH-ING,** 81 actor. He was best known for his horror film roles as Frankenstein. He starred in *Frankenstein and the Monster From Hell, Frankenstein Created Women, Dracula AD 1972,* etc.

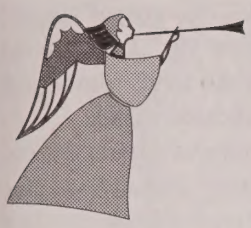
• **JAMES E. DINGMAN,** 81, retired vice chairman of the American Telephone and Telegraph Company. Earlier, as chief engineer at AT&T, he was involved in the development of satellite communications. He oversaw the first telecast beamed into space and back to Earth with an experimental satellite transmission to Telstar from Maine in 1962. He began his 44-year career in telecommunications in 1922 as an equipment tester for the Western Electric Company in Philadelphia. From 1964 to 1973 he was a director of Comsat, the Communications Satellite Corporation established by Congress.

• **PERRY W. ESTEN,** 86, W6PN, ex-8BOX, W8BOX, etc., pioneer amateur and radio engineer. He received his amateur license in 1926 as 8BOX in upstate New York which was then the 8th call district, and remained active on the air throughout the world for the next 68 years. He began his broadcasting career as an engineer and was associated with such stations as WHEC in Rochester, NY, WDAN in Danville, IL, and WENY in Elmira, NY. In 1954 he became chief of engineering for Radio Free Europe (RFE) and gained recognition for his expertise in high-powered antennas. He retired from RFE in 1973. Earlier he was involved in international radio engineering projects for Page Communications Engineers.

• **BEN GREENBLATT,** 88, pianist. He was associated with the Meyer Davis Orchestra for 40 years and his musical interludes, "Keys to Happiness," was heard on various Philadelphia radio stations from the 1930s to the 1960s.

• **ISH KABIBBLE** (real name Merwyn Bogue), 86, comic and cornetist. He was associated with Kay Kyser's Orchestra from 1931 to 1951. In 1949 and 1950 he was a regular on the TV quiz show *Kay Kyser's Kollege of Musical Knowledge.*

• **FRED KILIAN,** 83, TV pioneer who created such programs as *Tin Pan*



Alley, Super Circus, and other Chicago-based programs heard on the ABC network in the 1940s and 1950s. He was one of the first to broadcast full-length movies on TV, as well as a live detective show starring Mike Wallace.

• **ROY LaPLANTE,** 82, radio personality. He began his radio career in 1932 as an announcer on WHAT. Later he was a newscaster and an early morning host on WFIL-AM — now WEAZ-AM — in Philadelphia. In 1950 he joined ABC in New York as a senior producer.

• **CLAUDE MAHONEY,** 91, former reporter who became a broadcaster. His program *Once Over Lightly* aired over WTOP-AM in Washington in the early 1950s. He also had an agricultural news program on CBS radio called *Columbia County Journal.* He joined the Mutual Radio Network in the early 1960s and remained there until his retirement in the late 1960s.

• **HENRY MANCINI,** 70, multiple Oscar and Grammy award-winning composer and conductor. He was an Oscar for the *Breakfast at Tiffany's* score (1961) and another for the score of the 1982 film *Victor, Victoria.* In 1961 he received five Grammys for *Breakfast at Tiffany's*, including record, sound track and song of the year. He composed theme and background music for many TV shows — *Peter Gunn* (1958-1961), *Mr. Lucky* (1959), *The Andy Williams Show* (1962), etc.

• **STUART MEYER,** 76, W2GHK, electrical engineer. A former chief engineer of Hammerlund, he eventually became its president. He had also been associated with E.F. Johnson, Dumont Laboratories and Link Radio Corporation. At the time of his death he was president of the Radio Club of America. He was past president (1982-1985) of the Quarter Century Wireless Association, and in 1992 was recipient of its Distinguished Service Award.

• **HENRY MORGAN,** 79, satirical radio and TV personality. His 15 minute radio show *Here's Morgan* was heard in New York in the 1940s. Later it became a half-hour network program. During the 1950s and 1960s he was a frequent guest on the CBS quiz shows *What's My Line?* and *I've Got a Secret.*

• **VERA PRINTZ** (real name Veronica Pransketis), 89, entertainer. In 1928 she was one of the first women to sing live on the radio. She sang at the Paradise Ballroom in Newark, NJ, and during the 1920s and 1930s had an entertainment group called Vera Printz & Co., which performed at the Liberty Theater in Elizabeth, NJ.

• **WILLIAM B. RAY,** 86, former staff executive of the Federal Communications Commission. He joined NBC in 1933 as a publicity writer and became news director of the NBC Central Division in 1943. He became chief of the complaints and compliance division of the FCC's Broadcast Bureau in 1961. He retired in 1978 but was retained for two more years to rewrite policy statements enforcing its political equal time statute and Fairness Doctrine.

• **ANNE SHELTON,** 66, British radio singer. She achieved stardom as the Forces' Favorite" on a weekly radio program aired by the BBC during World War II. She recorded such hits as "Lili Marlene," "Silver Wings in the Moonlight," "Coming in on a Wing and a Prayer," etc.

• **THEODORE K. SMITH,** 89, electronics pioneer and former RCA executive vice president. He began his career with RCA's New York research and development staff in the 1920s. In 1928 he led its development work on television and built the experimental TV station W2XBS, now known as WNBC-TV, in New York. At the Camden facility in 1928, Smith was in charge of product planning in connection with broadcast and TV station equipment and electronic measuring. During World War II he handled military development programs for guided missiles, magnetic airborne detectors and Sonobuoys. He was appointed vice president and general manager of engineering products in 1953, executive vice president of defense-electronic products in 1955, executive vice president of industrial electronic products in 1957, and director of corporate planning in 1962.

• **MURRAY SPIVACK,** 90, professional percussionist and Oscar-winning sound mixer. He joined RKO studios in 1929. As one of the pioneer sound mixers, he recorded sound effects for the 1933 film *King Kong.* He won an Oscar for his work on *Hello Dolly.* Other credits include *Oklahoma, Sound of Music, My Fair Lady,* etc.

• **BARRY SULLI-VAN,** 81, film, stage and TV actor. He appeared in *The Caine Mutiny Court Martial* and other plays on Broadway. TV credits include *Night Gallery, Ford Theater, Suspense, Bonanza,* etc. Movie appearances included *Lady in the Dark, The Great Gatsby, Strategic Air Command,* etc.

• **LEWIS W. VAN NOSTRAND, JR.,** 79, broadcast executive with WMT Radio and Television and founder of the Cable Communications Company. The cable firm operates 15 franchises throughout Iowa.

• **CARL S. WALTHER,** 88, W1OPZ, a retired senior musician who was believed to be one of the last surviving members

of the earliest U.S. Coast Guard Band. During his 34-year career with the band he was known as the "dean of service band percussionists." He performed with the band in nine presidential inaugurations.

• **LAWRENCE W. (Bill) WHITE,** 63, broadcast veteran who was general manager of several major-market stations. He began his broadcasting career in 1964 with Kaiser Broadcasting where he served as vice president and general manager for: WKBK-TV in Cleveland; WKBG-TV in Boston; WKBD-TV in Detroit; and KBHK-TV in San Francisco. He served in the same capacity at KTTV-TV in Los Angeles, WJKS-TV in Jacksonville, and WFLA-TV in Tampa.

• **MARION WILLIAMS,** 66, gospel singer. Her two biggest hits were "Packin' Up," and "Surely God is Able." She appeared in the 1992 film *Fried Green Tomatoes* which was dedicated to her.

Information for this column was obtained from *The Boston Globe, Broadcasting and Cable, The Hartford Courant, The Maine Sunday Telegram, The New York Times, QCWA Journal,* and *Variety.*

Thanks to H. Paul Bohlander, W3VVS; Milton E. Chaffee, W1EFW; Jan Perry Esten; D.A. King, W1YCW; Joseph I. Lisaius; Brian Melody; and Robert G. Thomas, W3QZO, for additional source material.

SILENT KEYS

Dave Atkins, W6VX
Carlos Clark, W2ABD
Everett Gibbs, W8AQ
Don Ayers

— AWA News

Continued from page 5

In the contest first prize in the **Battery Radio** category went to Tom Pamula for a beautiful Kennedy 110 with matching 525 amplifier. Second place was a SCR-59 entered by Larry Babcock. Third place went to Karen Pamula for a "Splendid" set. A duplicate third place went to Gary Parzy for his National Airphone. In the **Crystal Set** category, Larry Babcock won first place with his French Gaumot crystal set and matching phones. Second was Gary Parzy with a Home-O-Phone. Marv Hesss took third with a Freed Eismann Marverl set. Marvin Hess won the first place ribbon in the **Locally Made Radio** category with a fine Colonial radio. Larry Babcock took second with a 1946 Pomenette. Top place in the **AC Radio** category was taken by Lloyd Swackhammer with a beautiful model 2531 Phillips radio and matching speaker. Larry Babcock's tube carved Wurlitzer console took second prize.

I am one who judges the success of a meet not by what I sell in the flea market but by what I acquire to add to my collection. In the donation auction I purchased a 1950 home-designed and built 12-inch TV. There aren't many of those around and I happen to know the builder. He was a radar engineer from Bell Aircraft and designed as built this TV as a hobby at home during the early days of television.

Everyone enjoyed the meet and the country location. If you missed the meet come and see us next year.

NEW JERSEY MEET & AUCTION

Saturday, November 5, 7 a.m. to 3 p.m.

The New jersey Antique Radio Club presents its close-the-season meet at Hightstown, rain or shine.

Auction: The indoor auction is detailed in a catalog, available in advance or on site. It will feature members' gear and material from two estates. Material is broadcast radios (an AK 10C breadboard and Amplion horn, etc.), communications and WWII military gear (like a BC-474), 1946-49 TV sets, tubes from a DeForest VT-21 and WE 205D to box lots, restoration parts, service literature, and some unique general literature. Auction starts at 11 a.m.

Location: The Hightstown Country Club, near Exit 8 of the New Jersey Turnpike and just off NJ Rt. 33. From the Turnpike go east on Rt. 33 to the first jughandle, and come back west. At first traffic light bear right onto Monmouth Street, then 300 yards to the country club. Rates to outdoor sellers: NJARC members, $12 per table, others $15; indoor tables, $20. Mention the "radio meet" for reduced room rates at the Town House Motel on Rt. 33 (800) 922-0622 or (609) 448-2400.

Contacts: Marv Beeferman, 2265 Emerald Park Drive, Forked Riber, NJ 08731 (609) 693-9430; or Ludwell Sibley (908) 782-4894.

PENNSYLVANIA MEET

Sunday, November 13

The Delaware Valley Historic Radio Club will offer its fall swap meet, indoors and outdoors, at the Tyro Grange Hall, US Rt. 202 and PA Rt. 413, Buckingham (Bucks County), PA. Equipment display. For info and vendor registration call (215) 646-6488 or (215) 368-2520.

CLASSIFIED ADS

OLD TIME ODDS & ENDS

Antique phono repairs, parts, needles, springs via UPS. Free catalog. Rod Lauman, 19 Cliff St., St. Johnsbury, VT 05819 (800) 239-4188 evenings

Are you looking for Antique Radios, parts, tubes, schematics and restoration service? For free 20 page list, send 2-stamp SASE to Howard Granoff, 2445 Lyttonsville Road, Suite 317, Silver Spring, MD 20910. (301) 585-8776 10AM to 10PM local time

Book *In the Shadow of the Shield* (see *OTB* notice: Feb. 1992), illustrated hardcover, 658 pages, based on oral histories, meticulously documenting the early days of W/T and radio in Kingston, Ontario: first local amateurs (1913), origins of Queen's University radio station (1902-22), WWI local W/T training, how Marconi came to Canada, the Marconi Great Lakes W/T chain, esp. VBH Kingston. Repeat customers call it fascinating and very readable...to be roundly congratulated...a wonderful tapestry on the evolution of radio broadcasting in a community. $27.95 (US$) or $32.95 (Can$) includes P&P. Order from Arthur Zimmerman, 204-670 Sir John A. Macdonald Blvd., Kingston, Ontario, Canada K7M 1A3 (613) 542-1789

SELL - BROADCAST

European AM-FM console Telefunken Receiver/ Phono - 1958 Vintage w/demo record for "Dynamic Expander." AC 50 cycle 110/125/240/270 volt; 4 broadcast bands, in mint condition cabinet — Salzburg III w/manual. Asking $250. plus shipping. Price negotiable. Tom Rosica, 125 Grandview Terrace, Batavia, NY 14020

Grundig Majestic International radio, Model 1088. AM/FM in perfect working order and cabinet in near perfect condition. George Eldred, 1206 Chanticleer Lane, Hinsdale, IL 60521

U.S. Apex cathedral radio, Model 7A. Cabinet needs some work, chassis untested. Knobs are probably not originals. Could be restored to a nice radio. $75 plus UPS. James Fisher, 344 Harrison Ave., Manville, NJ 08835 (908) 725-7476

SELL - GENERAL

Accepting offers til Jan.1 on 1927 RCA Model 1395 Commerical S.W. receiver, all original in mint condition with all plug-in coils. Includes original instruction manual indicating set came off the S.S.Matsonia, Matson Line flagship. See OTB of May 1989 article on similiar set now in museum. Charles Byrnes, Jr., 1201 Syacmore Terrace, No. 102, Sunnyvale, CA 94086 (408) 247-3417 or (206) 338-7187

Another new crystal detector. New cotton covered loop antenna wire and more. SASE for flyer. B&K 700 tube tester. Appears new. Original manual, supplements, scale overlays, even original advertising brochure. $125 plus shipping. Wanted: Old Headphones. Buy one pair or a hundred. Send your list and asking price. Dick Mackiewicz, 1549 N. River Rd., Coventry, CT 06238 (203) 742-8552

Atwater Kent Model 55 Pooley cabinet; AK Model 55 Kiel table; Magnavox 252 MX; Magnavox 138E; Emerson X183; GE TV 17127. Pick-up only. SASE for list. Vincent Gueber, 101 Vieau Dr., Syracuse, NY 13207 (315) 475-8603

BC314G by Farnsworth, very clean, $150. plus shipping; CAA RCQ, a National HRO with sliding box coil assembly, very clean, $150. plus shipping Dick Neish, W0SIR, Box 100, Chester, SD 57016-0100

Classic radio collection. Trading items include prewar communications receivers RCA ACR-175, National NC-100X (1936), 1938 NC-101X (early model with eye tube), complete rackmount HRO-M, Hallicrafters silver-dial 1937 SX-16 Super Skyrider and S-19R Sky Buddy; allwave receivers 1933 GE K-80 tombstones, 1935 15-tube Lafayette C-53 tabletop; postwar transmitters Heath AT-1/AC-1, Gonset Commander, Elmac AF-67 with power supply; postwar receivers Knight Span Master and Hallicrafters SX-110.Trade any/all for pre-war telegraph keys, including spark straight keys, McElroy, Vibroplex and others. Rick Ferranti, WA6NCX, 254 Florence Ave., Arlington, MA 02174-7248 No calls.

Fisher 500B stereo FM multiplex receiver with manual plus spare tubes, in excellent condition. Pick-up only. $100. Altec Lansing 604B bass reflex

speaker, in Altec mahogany cabinet, very good condition. Pick-up only, $250. Gerald Liccione, 118 Hiawatha Trail, Liverpool, NY 13088

Fisher Wide band multiplex FM tuner, Model 100B, fine condition, with tubes. $100; Fisher master audio control, Model 90, with tubes, fine condition. $100. John Connelly, Box 64, Matteson, IL 60443 (708) 720-9058

Hammarlund SP-600-JL with speaker, excel., $200; Hammarlund SP-600-JX, good, $125; Hallicrafters "Sky Champion" S-20-R, excel., $125; King Radio, excel., n/t, $125.; Zenith art deco bakelite radio model 5-R-317, good, $100; Tektronix 503 Oscilloscope, fair, $75; 10BP4A pix. tube, new, $25, All $ US negotiable, you pay shipping. Richard Marlow, 4 Corbett Ave., St. Catharines, Ontario, Canada L2N 5M4 (905) 934-9378

Hammarlund Comet Pro (battery version) - communications receiver, untested, good to excellent, $100.; Spielman Air Pilot, 5-tube battery set, audio transformers missing (under chassis), very good, $75. Also many other radios, books & collectable tubes. Send 2 stamps for complete photo-list to Ron Boucher, PO Box 541 (OT), Goffstown, NH 03045-0451 (603) 497-2988 Compuserve #72440,1356

Headphones — Baldwin Type C, mica diaphragm, impedance 20K ohms (1 khz). Very sensitive, ideal for xtal sets. Original cord and tips. Patented 1915. Excellent condition. $40. Lawrence Friedman, 578 Alpha Road, Grahamsville, NY 12740 (914) 985-7765

Just cleaned out 2 ham shack rooms, walls and file cabinets of QSL cards. Over 5000 in good and fair condition with tack holes. 100 assorted for $42.50 postpaid in USA. Frank Krantz, 100 Osage Ave., Somerdale, NJ 08083

Kolster Model K-20 cabinet, complete with claw feet and dial escutcheon, $35 plus shipping. Nick Viania, 54 Neutral Ave., Staten Island, NY 10306

Large lot of reel to reel tapes, 5"-12" with Jazz & Swing recordings from 1920s-60s; tape machines, 24" records, more too numerous to mention, all estate items. Please send large SASE for list. Martha Dudley, Rt. 1, Box 576, Hood, VA (703) 948-6290

Philco console 37-680, Freshman Masterpiece (5-01A's), Hallicrafters S-53A, Mc Martin amplifier LT252B, Roberts 990 tape recorder, Scott 296 stereo amplifier, National NC-300. Francis Yonker, W2IBH, 1229 Inverary Place, State College, PA 16801 (814) 867-1400

Philco 38-7 cabinet refinished, $125;Admiral Bakelite radio/phono, $75; Admiral Bakelite 17", $75; Clarion 11011, $30.; Heathkit EK-2, $25.; RCA 66X2 (no bottom), $60; Zenith 8G005TZ1Y, $85; Zenith H500, $85; Zenith 6G601M (sailboat), $55. All sets working. Shipping extra. Want speaker for Philco 38-7. Robert Rossi, 10936 Melbourne St., Allen Park, MI 48101

RCA 1949 Ionization manometer, used in a circuit to read very low vacuum - .001 microns. Has original seal. Trade for 3 Western Electric type 231 or 239 vacuum tubes, 3 each.;Trade Hanscom superhet made in Rhode Island for Garod Model V neutrodyne. Uses 6 UV199 tubes and has meter on right side. Tad Drogoski, N3JZQ, 507 Coal Valley Road, Jefferson Boro, PA 15025

RCA 9X571 cabinet and knobs. Ed Martin, 485 Benwood Hill Rd., Benwood, WV 26031-1301

Sparton 7-36; Arvin 444; Knight Span Master; Philco Tombstone Mod 60; Crosley Tombstone Mod 515; Belmont Cathedral 51-C;Crosley 1946 Wood Table 66T6; Hallicrafters "Echophone" Mod Ec-113; Philco Wood table Mod 48-482; Philco Wood table Mod 41-235; Majestic Mod 90-b. Want 1930s Arvin radios. Wayne Gilbert, 785 So. Flamingo Ct., Denver, CO 80222 (303) 321-6705

Wireless gear - 1914 Marconi E-2 Quenched Gap 1/2 KW spark transmitter Ser. No. 58, 300-600 meters. Will Jensby, 645 Gianniani Dr., Santa Clara, CA 95051 (408) 296-6071

SELL - KEYS & TELEGRAPH

Keys — straight, bug, KOB's, military and other telegraph items, etc. Large list. Send $2. (refundable) plus 2 stamps. Dr. J.H. Jacobs, 60 Seaview Terrace, Northport, NY 11768 (516) 261-1576

Machinist — Able to make parts for telegraph equipment. Could duplicate almost any missing part. Don Funkhouser, 5890 W. Vermont St., Indianapolis, IN 46224 (317) 244-8380

SELL - LITERATURE

RCA Radio Apparatus book, very clean, 1922, $55. Floyd Paul, 1545 Raymond Ave., Glendale, CA 91201

Baird 1930 Mechanical Television Manual, *The Romance and Reality of TV..Construction and Opera-*

tion of TV Receiving Sets, 68 pages, copy, with color cover, $14 ppd. *Sprayberry Academy of Radio Lesson on Mechanical Television,* 30 pages, copy, $13. ppd. Both for $20. Send 2-stamp SASE for large list which includes nearly 100 pre-1930 RCA bulletins. Gary Micanek, 226 Henry Ave., Manchester, MO 63011 (314) 227-7046

Complete sets *OTB*s Vol. 17 (June 1976) thru Vol. 30 (Feb. 1990), 56 issues, $95. postpaid. Harry Stavert, 7231-68th Ave. N.E., Marysville, WA 98270 (206) 659-1427

Have AK, E.H. Scott, Midwest literature and catalogs. Want to trade for McMurdo Silver literature, booklets, radios that I don't have. Don Hauff, Box 16351, Minneapolis, MN 55416 (800) 769-9980

My collecting days are over...selling 97 issues of *OTB* 1970-1993. $100 plus UPS. Clarence Filley, W7KE, 1109 S. 2nd St., Hamilton, MT 59840 (406) 363-1946

Original instruction manuals — Hickok Model 505 oscillograph (good) $10 postpaid (US); Rex Bassett Model 12 aircraft radiotelephone (fair) $8. Ken Hodge, KB4CM, 42846 Cinema Ave., Lancaster, CA 93534 (805) 945-4702

Sale of rare telegraph/telephony books and catalogs dating back to 1850. Large listing $2. Jim Kreuzer, N2GHB, Box 398, Elma, NY 14059

SELL - MILITARY

RCAF AR-2 reciver, 140KC-21MC, 12 VDC, in transit case, $150; Bendix MN26Y, clean, $50; TS-497C Signal Generator, working, w/manual, $50; R-109/GRC FM rcvr. 27-39MC, working, w/schematic, $30; 5.4CT/30A transformer, 120V primary, $30; Johnson 250-24 SWR bridge, in box, $25; Nuvistors 7587, 7895. Mel Stoller, K2AOQ, 100 Stockton Lane, Rochester, NY 14625 (716) 671-0776

SELL - PARTS

Atwater Kent 165 replacement grille fretwork. The 165 is the attractive small AK cathedral shown on page 30 of the brown Bunis book. Both mine and my friend Bob Cook's had broken grilles, as are most of the ones we find down here. We had a computer program written to laser cut exact replicas. Available for $30. US mailed to your home. Ian Sangster, 75 Anawhata Road, Piha Rural Delivery, Auckland, New Zealand. Phone 09-8149597

Grebe CR3A antenna inductor and switch arms, not original, make offer by mail before 12/15/94. Send $3.50 for three pictures. Robert Campbell, 2175 SE Pine, Hillsboro, OR 97123

Roller-Smith switchboard 750 watt meter (1920's); two 100 amp. knife switches; DPDT 30 amp.; Handbook for Electrical Engineering (1933), leather, thumb indexed; other goodies. Lot for only $75. with UPS. Walter Gerber, 212 Skyline Manor Rd., Southern Pines, NC 28387 (910) 692-3142 before 7 p.m.

SELL - TEST GEAR

Leeds & Northrup Variometer, early 1900s, cal. .1/.4 6H, #28866, $600; Var. Cap. Wm. J. Murdock Co., bakelite case, 4" dia., 0-170 engraved escutcheon, plated binding posts, $100. Plus shipping and packing. E.G. Marshall, 1800 Marion Avenue, Novato, CA 94945

SELL OR TRADE

Homemade galena crystal sets and parts. Galena crystals, $1. Leonard Gardner, 458 Two Mile Creek Rd., Tonawanda, NY 14150 (716) 873-0447

WANTED - GENERAL

Collins 75A2, speaker, accessory items; mechanical filters;McElroy or narrow based Vibroplex bug (any condition); DX-20 or Ameco AC-1. Brian Roberts, K9VKY, 3068 Evergreen, Pittsburgh, PA 15237 (412) 931-4646

RME 4300, 4301, 4350, 4350A or 6900 and related accessories. Also interested in Hallicrafters SX-42, SX-71, HT-19 and Hammarlund "Four-20" transmitter. David Lowenstein, N7AF, 236 East La Jolla Drive, Tempe, AZ 85282

Audion Valve with broken filament (no replicas!); Regency TR-1, WWI receiver (tube or crystal) and WWI transmitter (tube or spark) in any condition; WWI wireless parts like spark-gaps, loose couplers, rotary sparks, coherer, etc. Will pay fair prices, covering all freight costs and if you want I will try to help you with European stuff (any "Volksempfanger" and Loewe tubes are available). Patric Paris, Metzinger Str.8, 72581 Dettingen Germany. Fax: 0049-712136670. Compuserve 100121,1035

Baird Televisor; commercial or military spark gap era transmitter and receiver; tube-rack for D-10 DeForest; grill for Pilot TV-37; manual and recording roll for Comptometer "Dupli-Voice;" and all Ediphone manuals. Jim Chisman, POB 1111, Clemson, SC 29633

IR Converter tubes such as 6032A, 6914 and others. Any type night vision equipment, man portable radar

etc. Especially want German WWII radio, night vision, radar and any parts thereof. Got anything weird? Also need Rider's Vo. 1 to 5, 9, 11 and 15. Bill Williams, PO Box 63, Regina, KY 41559

Looking for carrying case (both pieces) and/or front panel for RCA P31 portable radio in fair condition or better. Tino Zottola, VE2GCE, 5443 Mac Mahon Ave., Montreal, Quebec, Canada H4V 2C1

Manual for the Millen 90881 RF Amplifier, plug-in inductors and 812A or 812H tubes for this unit. Also want Millen 90281 High Voltage Supply, Millen 90711 VFO and Millen 90905-B Oscilloscope. Thanks. Mike Ruggiero, W2NVR, RD 3, Box 3358, Saylorsburg, PA 18353 (610) 381-3211

Murdock radios, headsets, memorabilia, etc. Anne Christopher, 44 Rendezvous Lane, Barnstable, MA 02630

Music Master wood horn speaker. OK if in need of repair. Severin Dvorsky, 380 Morrison Drive, Pittsburgh, PA 15216 (412) 344-6633

National "BM" dial, information from *Short Wave Craft* Feb. or Mar. 1931. Rich Oliver, KC9GQ, Box 1872, Flagstaff, AZ 86002 (602) 774-7527

Need following for a Sparton Model 931: Complete loudspeaker assembly and owner's or service manual, reproductions OK. Thanks! Tom Dickinson, 407 N. Florida St., Arlington, VA 22203-1334 (703) 841-4992

Pictures of DeForest RJ4 Audion cabinet, rear, left side and inside for duplication. Schematic for Western Electric Model 3A receiver and related data. Also other equipment data. Also need 114B Vacuum tube; restorable Garrod V, a six-tube neutrodyne; General Radio Variometer Model 209;Volume I Riders manual; adapter for Hickok 532 tube tester to check Nuvistor tubes; schematic for a Micronta 22-210 volt/ohmmeter sold by Radio Shack; 3 similiar Bakelite sockets for UV199 tubes; tapped switch as used on AK20 & 21 p/n 7650 (need 2); Tungar bulb for Westinghouse storage batterly charger, 2 or 6 amp. Tad Drogoski, 507 Coal Valley Road, Jefferson Boro, PA 15025-3703

RCA ACR-111;RCA AR 88 communications receivers. Cash and/or AK breadboard parts; Philco hand painted 511, 512; Philco 680X super hi-fi console. Charles Rhodes, 3906 Quisenberry Dr., Alexandria, VA 22309-2048

TECLA (Thomas E. Clark) wireless equipment, radios, and/or literature of any sort wanted. Also want McMurdo Silver Model 5-D high frequency receiver. Jim Clark, 1292 Starboard Dr., Okemos, MI 48864 (517) 349-2249

Working chassis for Spartan Model 737 floor model. Will pay fair price. Nick Viania, 54 Neutral Ave., Staten Island, NY 10306

Working Scott Metropolitan AM/FM Model 16A receiver. Includes Garrard type A turntable and 15 inch speaker, in blond cabinet, with manuals. $300 and buyer picks it up. Call first. Reginald Collins, KE2HE, 183-69 Brinkerhoff Ave., Hollis, NY 11412 (718) 454-5361

Zenith Chassis 6A02 for model 6S527 table model, complete, less tubes, and restorable. Also need the following Philco 90 cathedral parts for chassis using one 47 output: speaker with good wiring and good unbroken plug, original line cord plug, 2 original globe type 27 tube shields, 2 original filters that fit in the rear right corner of this particular 90 chassis. Thanks. Ed Martin, 485 Benwood Hill Rd., Benwood, WV 26031-1301

WANTED - INFORMATION

Any paper, originals or copies, on the Lettine Radio Transmitter, Model 240. I will gladly repay you for your costs and effort. Robert Stapleford, 1800 SW Randolph Ave., Topeka, KS 66604

Information or a FET modified WD-11 for use in making a Radiola RS operational. John Hollar, W3JJU, PO Box 30, Hummesltown, PA 17036-0030 (717) 566-0979

Need schematic or photocopy for 1928 Grebe Model Syncrophase A-C Six Serial No. DKJD with binocular RF coils and any information on wood cabinet for same. Paul Nevatt, 1114 S. Stewart, Springfield, MO 65804 (417) 862-1797

Original or photocopy manuals for RCA Radiola RS, Radiola III and Radiola IIIA. Robert Schmitz, 5925 Grace Lee Ave., Sykesville, MD 21784

WANTED - KEY & TELEGRAPH

If is says "T.R. McElroy" on it, I'm interested. Help complete the world's best collection of Mac Keys. Tom French, W1IMO, "The McElroy Collector," 120 Great Road, Maynard, MA 01754 (508)897-2226

Older J.H. Bunnell single earpiece headset and other JHB stuff. Dr. J.H. Jacobs, 60 Seaview Terrace, Northport, NY 11768 (516) 261-1576

Telegraph items such as pre-1870 keys, registers, etc. Unusual bugs from oddball manufacturers, and large spark era keys especially oil break types; Foreign or domestic equally welcome. Gil Schlehman, K9WDY, 335 Indianapolis Ave., Downers Grove, IL 60515 (708) 968-2320

WANTED - LITERATURE

Radio Boys books by Chapman with original dust jackets. Henry O'Meara, 42 Aqua Ra Drive, Jensen Beach, FL 34957

Transistor Radio literature. Service manuals, magazine ads, brochures, displays, anything pertaining to transistor radios. Lots of same to trade/sell. Let me know what you have/want. Original and photocopied material available. Robert Ross, VA3SW, Box 1003, Stn. B, London, Ontario, Canada N6A 5K1 (519) 685-1167

WANTED - MILITARY

Canadian or equivalent radio sets No. 19 Mk II or III, No. 62 and accessories; European PE 06/40P, TB 3/750 or 5867/AX-9901 tubes. Geoff Fors, WB6NVH, PO Box 342, Monterey, CA 93942 (408) 373-7636, Fax (408) 373-2345

Wish to correspond with WWII aircraft pilots & radiomen. WWII & early jet avionics & radar wanted. Anything pertaining to early tube computers like ENIAC, UNIVAC, etc. Meters & instruments. Electrical control panels. Any old or unique electrical gear. Chris Cross, Box 94, McConnell, IL 61050

WANTED - PARTS

Admiral flyback transformer number 79D138-18 and 79D166-3; also picture tubes 9WP4 and 9YP4. James Maloney, 1703 Leno Rd., Macedon, NY 14502

Hammarlund HQ170 slot frequency coil, part no. K-42034-1 or junker chassis for parts. Gerald Liccione, W2TPL, 118 Hiawatha Trail, Liverpool, NY 13088

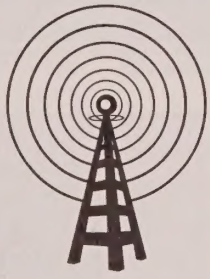
Looking for the following for an Allied SX/AX-100 receiver: The whole IF board, or at least the BFO/IF xfmr can from same. Edward Shaw, 604 Green Ridge Court, Lexington, KY 40517-1934 CompuServe #73762,1602

Metal tube cover for RCA Radiola 26 portable or will purchase junker set or cabinet to get this part. Dave McClellan, 1086 Trailridge Lane, Atlanta, GA 30338 (404) 399-6704

Music Master wood horn speaker, condition not important; also need Edison radio chassis mounting field coil speaker. Severin Dvorsky, 380 Morrison Dr., Pittsburgh, PA 15216 (412) 344-6633

National SW-3 coils, 2.5 V doghouse PS (5880,5887,5897), NC-100, HRO, AK speaker, speaker for Crosley Trirdyne, A,B,C voltage PS for battery radios. Have for trade National SW-3 coils for similiar coils, 6V PS for 2.5 V PS. Carter Elliott, 1460 Pinedale Rd., Charlottesville, VA 22901 (804) 979-7383

Need following for a Sparton Model 931 — complete loudspeaker assembly and owner's or service manual, reproductions OK. Thanks! Tom Dickinson, 407 N. Florida St., Arlington, VA 22203-1334 (703) 841-4992



RCA Radiola 28 cabinet; RCA 140 Speaker and chassis; Speaker for Philco 90 Cathedral. Mark Cowart, N4FBL, PO Box 550766, Jacksonville, FL 32255-0766 (904) 724-1364

Set of 5-pin coils for Measurements Corp. Model 59 G.D.O. (Head designated 59LF, 100KHz to 4.5 MHz). I have extra set of coils for Model 59, HF/VHF Head (2.2 to 420 MHz) Hank Olson, 1751 Croner Ave, Menlo Park,CA 94025

The following chassis, AK228, General Motors 250, Westinghouse WR-14, Majestic 363, Philco 37-87, 42-340, Crosley 125, 1137. Also a cabinet for a Radiola Regenoflex. Junkers considered in needed parts are decent. Brian Kurrle, 208 Crafton Rd., Bel Air, MD 21014 (410) 838-6534 nights (410) 592-6202 days

---

Tube audio output transformers made by Acrosound, Peerless, Western Electric, Dynaco, etc. Also tube amplifiers. Need Vitamin-Q capacitors and 2A3, 6B4G tubes. Jeffrey Viola, 784 Eltone Road, Jackson, NJ 08527

Tubes wanted, 2A3, 6B4G, 5AR4/GZ34, 6CA7/EL34, 6550, KT88, others. Also audio transformers. Jeffrey Viola, 784 Eltone Rd., Jackson, NJ 08527 (908) 928-0666

WANTED - TEST GEAR

"Reward" early test equipment manufactured by Readrite, Sterling, Jewell or Weston. Must be complete. Gary Formica, 823-91st St., Niagara Falls, NY 14304 (716) 283-2274

Boonton 260-A Q Meter, General Radio 1650A or 1650B RLC bridge, Hewlett-Packard 4260A RLC bridge. Christopher Demeroukas, PO Box 1132, Springfield, IL 62704

WANTED - RADIO

Atwater Kent Model 44, has to fit Pooley cabinet. Must be in working order. Thanks. Louis White, 15 Cottage St., Ilion, NY 13357

Canadian Westinghouse WD-25 or WX-25 radio tube for museum collection. Trade for Western Electric or other tubes, or cash. Ross Smith, 1133 Strong Ave., Elkhart, IN 46514 (219) 295-7770

E.H.Scott radios and Selectone coils in any condition. John Meredith, 1644 Parkside Circle, Niceville, FL 32578 (904) 897-7734

Any factory-made crystal set. Collection now at 312 pieces. seeking more. Especially want a perfect Federal Junior crystal set! Erwin Macho, Ambrosweg 17/A/8, A-1230 Vienna, Austria

Boy's transistor radios and Boy's parts sets. Trades welcome. Gary Willoughby, 5930 W. Jefferson Blvd., Los Angeles, CA 90016 (310) 559-0706. FAX: (310) 836-6518.

McMURDO SILVER MASTERPIECE VI

Bruce Kelley, W2ICE
59 Main Street, Bloomfield, NY 14469-9336

Of the three VIs in the AWA Museum, this model, the "Clifton," is outstanding in appearance. The VI, circa 1935-36, uses 21 tubes with a pair of 6L6s in the output. The set required a minimum of restoration and is an excellent example of a pre-World War II classic.

McMurdo Silver started his radio career in the mid-20s with John Marshall, and in 1933 founded a company carrying his name. The McMurdo Silver Co. went bankrupt in 1938 and it was bought out by the E.H. Scott Co. In 1948. Silver committed suicide with one of his antique guns.

Of particular interest to all at AWA headquarters is the fact that in his youth, McMurdo lived in Geneva not far from the museum. He was a close friend and neighbor of AWA member Cliff Daykin, W2AFE, with whom he spent many pleasant days target shooting. In addition to being an ardent gun collector, "Mick" in later years acquired a large collection of early radios and tubes. While consulting at the Ford Dearborn Museum, this writer identified many early pieces which he had donated.

A gem in the AWA Museum collection.

THE MUSEUM

AWA Electronic Communication Museum

FREE ADMISSION

Location: Village Green, Rts. 5 & 20, Bloomfield, NY.

Hours: May 1 through Oct. 31 — Sunday, 2-5 p.m.; also, June 1 through Aug. 31, Saturday, 2-4 p.m. and Wednesday, 7-9 p.m. (Closed holidays.)

Group Tours: By appointment.

Museum Telephone: (716) 657-6260

Amateur Station: W2AN

Mailing Address: Bruce Kelley, Curator, 59 Main St., Bloomfield, NY 14469

MUSEUM ACTIVITY

By Bruce Kelley

The museum has just completed another busy season with attendance peaking Sunday afternoons. The museum was opened off-hours for school groups, clubs and out-of-country visitors. Artifacts were loaned to nearby theater groups and several public museums for display.

Annex workers continue accessioning incoming material and are currently working in the large amateur/commercial receiver area. It is here that each receiver or transmitter is cataloged by type, year, condition, donor and location.

A videotape recording has been made highlighting outstanding museum exhibits. The season's prime acquisition is the lou Moreau historical collection which consists of 30 boxes of keys, telegraph instruments and books.

THE LETTER 'S'

Did Marconi really receive the letter "S" in Newfoundland in 1901 from the Poldhu, England, longwave transmitter? The question has been debated by radio historians for the past 90 years. The latest on the subject comes from John Belrose, VE2CV, director of radio sciences at the Research Center in Ottawa, Canada.

John has researched the subject both on paper and with an experimental spark transmitter and concludes it is doubtful the three dots were heard either on the fundamental frequency or the broad signal on shortwave.

The transmission were made on low frequency during daylight minimizing the possibility of being heard any distance. The transmitting antenna was tuned to longwave with little radiation on shortwave. Since the Italian coherer (receiver) was untuned and without amplification, the odds were very remote that anything was heard other than static.

John is not alone in his belief. A lengthy article in the July 1994 issue of the British publication *Electronic World* tends to share his findings. There is little doubt, however, that the Poldhu signals were received on a ship in the Atlantic using a conventional coherer actuating a Morse "inker" or register.

— B.K.

RECENT DONATIONS TO THE AWA MUSEUM

(Parts, sets, magazines, books, etc.)

Tom Galbreath, W2AXX; Joe Meyers, W2VW; Fred Hammond, VE3HC; Helen Donner, WA4IWM; Al Sienkiewicz, AA2FI; Fred Norvik, W2GH; Chuck Bliley, K3NAU; Steve Milovich, N2OSM; Lou Moreau, W3WRE; Henry Olson, W6GXN; Bro. Pat Dowd, W2GK; Bill Buchan, W2OMV; Will Jensby, W0EOM; Bob Hodge, Arnold Wilson, Steve Cotton and Serge Olshansky.

ANNUAL CONFERENCE '94

Photos By Bruce Roloson

More Inside

RADIO COLLECTORS DO IT WITH MORE FREQUENCY